

ALCOHOL-INDUCED STRESS AND SOCIAL SUPPORT AS INFLUENCES
OF THE ADULT SUBSTANCE ABUSER'S HEALTH AND WELL-BEING

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Submitted to the Graduate Faculty of
the School of Social Work in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy

University of Pittsburgh

2005

UNIVERSITY OF PITTSBURGH
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This study investigates the impacts of alcohol-induced stress and social support on individual health and well-being of alcoholics. Specifically, this dissertation study aimed to test: (a) the direct effect of alcohol-induced stress on three outcome variables that are relevant to an individual's health and well-being, (b) the direct effect of social support on three outcome variables, and (c) the interaction effect between alcohol-induced stress and social support on three outcome variables. This study also attempted to explore the roles of separate sources of social support in relation to three outcome variables.

Thus, this study hypothesized that (1) higher levels of perceived alcohol-induced stress would associate with lower life satisfaction, higher depressive symptoms, and higher physical health problems, (2) social support would positively associate with life satisfaction, and negatively associate with depressive symptoms and physical health problems, and (3) the effect of alcohol-induced stress on life satisfaction, depressive symptoms, and physical health problems would be reduced when social support was high.

This study is based on a secondary analysis of data collected for the Gateway Rehabilitation Center Study (GRCS), which studied the effects of perceived social support in adult substance abusers. Three hundred thirty individuals participated in this study and data on 326 individuals were analyzed.

The results showed that stress due to alcohol abuse had direct effects on three outcome variables, indicating that high levels of perceived stress due to alcohol abuse contributed to lower life satisfaction, higher depressive symptoms, and higher physical health problems in alcoholics. It was also found that social support had a direct effect on individuals' health and well-being for two of the three outcomes studied. However, this study found no significant buffering effect of social support in the relationships between stress due to alcohol abuse and its negative outcomes.

It is interesting that spouse, relatives, and friends support is actually significantly beneficial for physical health problems and possibly life satisfaction, since these sources might be regarded as contributors or enablers. The findings of this study can be incorporated into the treatment design and could be an important component of treatment planning for alcoholics. Cognitive interventions could be employed to increase individuals' awareness of the social support in their life. The results of this study can be also applied to intervention system for alcoholics to improve the quality of care without necessarily increasing the cost.

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I. INTRODUCTION

A. Statement of the Problem

Although some individuals drink alcohol or use drugs without becoming dependent on the substances, many people develop problematic addictions. According to the data from the National Comorbidity Study (NCS), approximately 14% of the general population has a lifetime history of alcohol dependence (Kessler, Crum, & Warner, 1997). Nearly 14 million Americans meet diagnostic criteria for alcohol use disorder (Grant, Harford, & Dawson, 1994). Substance abuse has become an important area of public policy not only because of appropriations for treatment programs but also because of the enormous costs that substance abuse extracts from society (Karger & Stoesz, 1998). The cost of psychoactive substance use disorders has been estimated at \$200 billion annually (Rotgers, Keller, & Morgenstern, 1996). Additionally, 3.3 percent of persons involved in the social welfare system in 1992 received services because of problems, impairments, or difficulties resulting from their abuse of alcohol or other drugs. The amount of total social welfare costs (benefits plus administrative costs) attributable to alcohol and drug abuse was \$11.4 billion in 1992 (Lyman & Potter, 1998).

Substance abuse typically produces a wide array of life problems and consequences such as severe health problems, nervousness and anxiety, and problems with the law (Peyser, 1982; Rose & Zweben, 2002; Sayette, 1999; Smyth, 1998). Many assume that the more alcohol someone consumes, the greater the risk for developing alcohol-related problems (McCreary & Sadava, 2000). These problems and consequences may be regarded as life stressors that exacerbate stress levels over what

they might have been previously. While most studies show a positive association between stress and drinking problems, little is known about how alcohol-induced consequences may act as stressors. Although the idea that stress affects health and well-being is widely accepted by the public and among many researchers (Turner & Lloyd, 2004), the role of secondary stress in substance abusers' lives has still not been adequately investigated. Secondary stress due to the stress experiences of substance abuse stems from the problems that emerge in self, other social roles, or network relations as a result of substance abuse. This study focuses on the association between this secondary stress in alcoholics and its relevance to an individual's health and well-being in order to improve our understanding of the relationship of alcohol-specific stress to substance abusers' well-being.

Since the 1970s, social and behavioral sciences have used the term social support to refer to social relationships in the context of health and well-being (Barrera & Ainlay, 1983; Walker, Wasserman, & Wellman, 1994). For example, social support has been acknowledged as one potential protective factor against the development of substance use problems. Averno and Hesselbrock (2001) found that supportive family relationship has been associated with lower drug and alcohol use. Social support has also received attention as a stress-buffering resource (Dobkin, De Civita, Paraherakis, & Gill, 2002). For example, House (1981) has postulated that social support may reduce the perceived importance of the problem, facilitate healthy behaviors so that people are less reactive to perceived stress. These findings showed that research on the health effects of social support has consistently indicated that social support enhances physical and mental health in various populations. However, few of these studies analyze how social support is

distributed within the substance abuser population or on which sources of social support substance abusers can rely. This study attempts to fill this gap by exploring the social support system of substance abusers.

B. Purpose of the Study

The purposes of this study are: (1) to describe this alcoholic treatment sample on stress, social support, and three outcome variables of depression, physical health, and life satisfaction, (2) to test the direct effect of alcohol-induced stress on three outcome variables in this sample, (3) to test the direct effect of social support on three outcome variables, (4) to test the interaction effect between alcohol-induced stress and social support on three outcome variables, and (5) to explore the roles of separate sources of social support in relation to three outcome variables.

C. Significance of the Study

This study adds to the existing body of knowledge about the impacts of alcohol-induced stress and social support on individual health and well-being of alcoholics. Of more specific importance, it contributes to research focused on the exploratory analysis of separate sources of support in relation to three outcomes that are relevant to an individual's health and well-being. Using main and buffering model of social support, this study tests the main effect of support on three outcome variables such as depression, physical health, and life satisfaction, and buffering effect between alcohol-induced stress and support.

Stress-social support studies have made a significant contribution to understanding how individuals cope with specific stress. Social workers can use this knowledge in counseling clients confronting difficulties including alcohol-induced stress and their families to readjust in difficult situations.

Understanding how individuals perceive and engage different kind of social support is an important step towards better knowledge about the sources of social support that may be critical for more effective support-based interventions (Gottlieb, 1985; Green & Rodgers, 2001). Social workers have the potential to empower the clients to make positive changes in their environment. This study provides information that contributes to the understanding how individuals perceive and engage different kinds of social support is an important step towards better knowledge about the sources of social support that may be critical to informing the development of more effective support-based interventions (Cutrona & Russell, 1990; Green & Rodgers, 2001; Wills, 1985).

II. LITERATURE REVIEW

A. Alcohol Problem Severity as Stress and Its Negative Consequences

The 1996 National Household Survey on Drug Abuse estimated that 5 % experienced heavy alcohol use during the past month and 15% experienced at least one occasion of binge drinking during the past month (Matano, Futa, Wanant, Mussman, & Leung, 2000). Moreover, in 1999, approximately 9% of persons aged 18 to 25 (an estimated 3 million) were dependent on alcohol (Substance Abuse and Mental Health Services Administration, 2001). Nearly 14 million Americans meet diagnostic criteria for alcohol use disorder (Grant, Harford, & Dawson, 1994).

There is a growing acceptance that the impact of substance abuse has become a more global problem, with greater acknowledgement of the role of alcohol and drug use in the incidence of health disorders and quality of life among substance abusers. Power, Hartnoll, and Charlmers (1992) found that drug misusers who entered treatment reported a significantly higher number of negative life events than those who did not (Tsogia, Copello, & Orford, 2001). According to Finney and Moos (1995), people were more likely to enter treatment if they perceived their drinking problem as more severe and experienced more adverse consequences as a result of drinking. Johnson, Brems, and Burke (2002) found that a higher level of substance use led to more stressors in daily living, giving up more activities, physical, emotional, legal, and financial problems, and increased likelihood of guilt regarding substance use. In addition, they found significant relationships between poorer physical health, poorer functioning in a variety of areas, poorer mental health, and severity of drug use. Severe alcohol use provides discrete

stressor (stressful life events) and, perhaps, “strains,” and is expected to relate to a set of negative outcomes that is relevant to an individual’s health and well-being. As expected, a variety of problems caused by excessive consumption of alcohol were reported by many investigators. Specifically, this section focuses on the direct effect of alcohol problem severity, as a reflection of stress on negative outcomes such as lower life satisfaction, worse physical health, and higher depressive symptoms.

1. Severe Alcohol Use and Mental Health

The first consideration is the possibility of an association between severe alcohol consumption and mental health. There is substantial evidence that substance abuse is associated with impaired mental health, particularly depressive symptoms. For example, in the Epidemiologic Catchment Area (ECA) survey, which surveyed 20,000 individuals in community and institutional settings at five sites across the country, 13.5% received alcohol-related diagnoses, and this number increased to 22.3% among those with psychiatric diagnoses including depression (Regier, Farmer, Rae, Locke, Keith, Judd, & Goodwin, 1990). Schuckit, Irwin and Smith (1994) examined the relationship between alcoholism and depression among 239 alcohol-dependent men. They found that it is likely that in the context of heavy drinking severe depressive episodes are likely to be observed. There is also evidence of the influence of alcohol drinking and illicit drug use on other mental health problems. From a nationwide general population survey in Greece, more frequent illicit drug users together with problematic drinkers exhibited higher average depressive symptom scores (Madianos, Gefou-Madianou, & Stefanis, 1994).

2. Severe Alcohol Use and Physical Health

Many studies have demonstrated an inverse relationship between alcohol and physical health (e.g., coronary heart disease). For example, Potter, Bannan, and Beevers (1984) examined a potentially causal link between excessive alcohol consumption and hypertension. According to Pavia, La Mothe, and Kavanagh (2004), prolonged consumption of an excessive amount of alcohol causes decreased immune responses, thereby seriously limiting the ability to be protected from certain infectious agents. They also indicated that those who abuse alcohol are more susceptible to certain infectious disorders and are more prone to alcohol-induced illness. Bradley, Badrinath, Bush, Boyd-Wickizer, and Anawalt (1998) examined medical risks for women who drink alcohol. They found higher levels of alcohol consumption by women were associated with increased mortality and breast cancer. Women who drank heavily also appear to have increased hypertension. Glenn, Parsons, and Steven (1989) assessed effects of alcohol abuse on physical health. They indicated that alcoholics suffer pervasive physical health difficulties and the effects of alcohol abuse on health appear to be predictor.

3. Severe Alcohol Use and Life Satisfaction

Finally, for many people, heavy drinking culminate in intense feelings of alienation, separateness, emptiness, meaninglessness, and lack of purpose in living (Hingson, Mangione, Meyers, & Scotch, 1982; Jordon & Oei, 1989; Okundaye, Smith, & Lawrence-Webb, 2001). Thus, the impact of stress caused by substance abuse can have far-reaching consequences on daily functioning and quality of life. In the context of problem drinking and drug misuse, it is investigated that greater number of alcohol

problems are associated with a poorer quality of life (Rudolf & Watts, 2002). In a study of Smith and Larson (2003), they reported that people undergoing treatment for substance abuse have lower quality of life scores in physical functioning and mental functioning. Kraemer, Maisto, Conigliaro, McNeil, Gordon, and Kelly (2002) examined the relationships between changes in alcohol consumption and quality of life and alcohol-related consequences in an outpatient sample of drinkers. They found that outpatient drinkers who sustain a reduction in alcohol consumption reported modestly improved quality of life and fewer alcohol-related adverse consequences when compared to drinkers who did not sustain a reduction.

Overall, severity of alcohol consequences is to be regarded as stress and is expected to relate to a set of negative outcomes, because stress leads to such bad outcomes. The existing literature on alcohol use behavioral consequences and depression, physical health, and life satisfaction is consistent with this. Most of these studies on problem drinking acknowledge a strong relationship between alcohol abuse and individual well-being and health, and problem drinking was a significant predictor of psychological symptom levels, physical health problems, and lower life satisfaction. However, there have been little studied to establish that the secondary stress induced by alcohol use itself exacerbate alcohol outcomes. This study investigates the complex issues of substance abuse-induced stress, life satisfaction, and physical and mental health.

B. Main and Buffering Model of Social Support

A purpose of this study is to examine the importance of perceived availability of social support as it applies to the negative outcomes of alcohol-induced stress that are relevant to an individual's health and well-being. Two major models, or sets of hypotheses, have been proposed to explain how social support has a positive impact on an individual's well-being and health. Researchers demonstrated the direct and buffering effects of social support on well-being and health (Walker, Wasserman, & Wellman, 1994). For example, Gottlieb (1985) has offered a framework within which to study the effects of social support on personal health. According to his study, personal and social resources can have a direct effect, acting to reduce exposure to stressful events and to enhance the health of the individual. They can also have a buffering effect, preserve positive self-appraisals in stressful situations and protecting against depression when negative reactions occur.

This study extends previous research about stress and social support by testing two models of social support in this sample. The first model tests the direct effects of social support on the negative outcomes of alcohol-induced stress that are relevant to an individual's health and well-being. The second model assesses whether the interaction of social support and a specific type of life stress (alcohol-induced stress, as measured by the Inventory of Drug Use Consequences) explains lower depressive symptoms, better physical health status, and higher life satisfaction.

1. The Main-Effect Model

The main effect, or direct effect, model posits that social support enhances well-being and health regardless of the level of stress a person is experiencing (Cohen & Syme,

1985). According to Cohen and Wills (1985), positive effects of social support are possibly due to membership in large social networks providing people with consistent positive affect, stability in one's life situation, and recognition of self-worth.

The main-effect model holds that an increase in social support will result in an increase in well-being irrespective of the existing level of stress. This model was tested in empirical studies by statistical main effects of support on outcomes (Mallinckrodt & Bennett, 1992).

For example, Humphreys, Moos, and Cohen (1997) examined whether support can predict better drinking-related outcomes in 628 alcoholic individuals. They found that support predicted lower depression, and higher quality of friendships and family relationships. Beattie and Longabaugh (1997) examined the relationship between perceived social support and subjective well-being in 140 participants who completed an outpatient treatment for alcoholism. They found perceived social support is highly positively correlated with subjective well-being. Newcomb and Bentler (1988) examined the impact of drug use on health and psychosomatic symptoms in 645 young adults, and found social support can provide positive influences on psychological, social, and health functioning. In a longitudinal study of 3-wave panel model, Peirce, Frone, Russell, Cooper, and Mudar (2000) examined longitudinal relations between social support and depression in a random sample of 1,192 adults. They found that perceived social support had a longitudinal and negative relation to depression. Brennan and Moos (1990) investigated associations among life stressors, social resources, and health outcomes. Problem drinkers (N=501) reported that less support from extended-family members and friends consumed more drinking problems and depression. Zea, Belgrave,

Townsend, Jarama, and Banks (1996) examined relationships between depression and social support in a sample of 109 African American and 57 Latinos with disorders including substance abuse. Results indicated that social support was significant predictor of depression for Latinos. That is, for Latinos, social support from others had a positive impact on mental health outcomes such as depression.

These findings are consistent with researches on social support and outcome of alcoholism treatment (Bischof, Rumpf, Hapke, Meyer, & John, 2000; Booth, Russell, Soucek, & Laughlin, 1992; Gordon & Zrull, 1991). For example, Booth et al. (1992) examined whether overall social support can predict recidivism. Results indicated that patients reporting higher levels of social support during alcoholism treatment demonstrated less readmission within 1 year of discharge compared to patients with lower levels. In a study of 128 opioid maintenance treatment patients, Wasserman, Stewart, and Delucchi (2001) found patients who had higher levels of abstinence-specific functional social support, defined as fewer cocaine users in their close social networks at study baseline, were significantly more likely to be cocaine-abstinent at follow-up, even with baseline cocaine use statistically controlled. Nyamathi, Flaskerud, and Leake (1997) evaluated the impact of social support on mental health characteristics in a sample of homeless and drug-recovering women. They found that supports from friends who are substance users impaired recovery and high support from them lead to poor outcomes.

However, the evidence for the direct influence of social support is inconsistent. For example, Hagerty and Williams (1999) examined the effects of social support on depressive symptoms during stress conditions. They found that social support had no direct effect on depression. Sangon (2004) also found similar results with Harerty and

Williams' study. Results indicated that perceived social support had no direct effects on severity of depression in 142 Thai women. According to Weaver (2000), such inconsistencies in the research regarding the influence of direct effects of social support may reflect the lack of a theoretical base associated with the conceptual, methodological, and statistical study of social support. These findings lead this study to examine direct effects of social support on the negative outcomes of alcohol-induced stress that are relevant to an individual's health and well-being.

2. The Buffering Model

The other major model is known as the stress buffering model, in which people are believed to be protected from the negative effects of stress by the presence of social support in their lives (Cohen & Syme, 1985). Specifically, this means that under conditions of high stress individuals with high social support will have significantly better health outcomes than those with low support (Cohen & Wills, 1985). According to Cohen and Wills, this protective or buffering effect of social support may play a role at two different points in the process that links stress to illness. First, support may intervene between a stressful event and individual's stress response by lessening or preventing the stress response. For example, the knowledge that there are others who can provide needed resources in times of stress may help the person appraise the situation as less stressful. Secondly, social support may intervene between stress and a negative health outcome by reducing or eliminating the stress reaction (Stroebe et al., 1996). For example, House (1981) has postulated that social support may reduce the perceived importance of the problem, facilitate healthy behaviors so that people are less reactive to perceived stress.

The buffering hypothesis is tested in empirical studies by examining statistical interactions between levels of stress and social support in predicting stress symptoms. For example, Ystgaard (1997) examined whether the effect of negative life events on the symptom levels of psychological distress is diminished by social support from the family and friends in late adolescence. The results indicated that the buffer hypothesis was supported: both an increase in social support from family and friends reduced the effect of negative life events. Ames and Roitzsch (2000) examined the impact of social support on desire to use substances among 52 inpatient substance abusers. They found that social support moderated the association between incidence of stressors and desire to use substances. Johanson and Jennison (1994) examined the buffering effect of social support on drinking behavior in a national probability sample of 1,478 African Americans. Findings indicated that supportive social resources such as family and the church can attenuate the effects of negative life stressors on drinking behavior. Marshal and Chassin (2000) tested the moderating effects of social support on the relation between adolescents' affiliation with drug-use promoting peers and their alcohol use. Results indicated that social support from parents buffered the effects of affiliation with substance-using peers on alcohol use. They suggest that support can serve as protective factors by promoting qualities that serve to resist peer group pressure. Wills, Vaccaro, and McNamara (1992) examined the buffering role of emotional and instrumental support from parents in the relation between negative life events and substance use in a sample of urban adolescents. Results indicated social support had stress-buffering effects as a protective factor for lowering the use of substance. Jennison (1992) analyzed the buffering hypothesis in the relation between stressful life events and alcohol use in a

national sample of 1,418 older adults. He found that supportive resources had a stress-buffering effect to reduce the excessive-drinking response to life crisis. Especially, Peirce, Frone, Russell, and Cooper (1996) examined whether social support moderates the relationship between a specific type of stress (financial stress) and alcohol use. They found that social support had the buffering influence in the relationship between financial stress and alcohol use. Mallinckrodt and Bennett (1992) tested the buffering effects of social support in a study of 41 unemployed blue-collar workers who had worked in the timber industry. Researchers assessed stress by the length of unemployment and financial concerns, and assessed outcome stress symptoms by examining depressive symptoms and global psychological symptoms. They found that a specific provision of social support operated to buffer the effects of job loss on stress symptoms, especially depression.

However, the buffering effects of social support on well-being and health are also complicated and inconsistent in the previous studies. For example, Park, Wilson, and Lee (2004) examined how social support at work affects depression in a large workplace. They found social support did not buffer the negative effects of work factors on depression. Stansfeld, Fuhrer, and Shipley (1998) observed that there was no evidence of a buffering effect of support on psychiatric symptoms among men and women who experienced life events or chronic stressors. Pelfrene, Vlerick, Kittel, Mak, Kornitzer, and Backer (2002) examined the buffering effects of social support in the relation between strain and psychological well-being in a large workforce sample in Belgium. The buffering hypotheses, however, were definitely not supported. Results indicated that

neither supervisor nor co-worker support displayed a buffering effect on the relationship between high strain and indicators of psychological well-being.

One explanation for this inconsistency is that the influence of different sources of support on outcomes may differ depending on the individual's source of social support.

Many studies examining the effect that social support has on the relationship between stressful environments and adjustment have focused on one or two aspect of social support (e.g., support from family and friends). For example, in a study of 85 adult children of alcoholics, Ohannessian and Hesselbrock (1993) found that perceived social support from friends significantly moderated the relationship between family history of alcoholism and several indicators of alcohol use.

However, the influence of different sources of support on outcomes is also inconsistent and complicated. For example, perceived social support from family members did not moderate the relationship between family history of alcoholism and several indicators of alcohol use (Ohannessian & Hesselbrock, 1993). The direct and buffering effects of social support on health and well-being may differ depending on individual circumstances. According to Ohannessian and Hesselbrick (1993), friend support may become more important than family support during adolescence. Also, friend support may be more important than family support when social competence is the variable of interest.

These findings suggest the importance of considering different sources of social support and show that the direct and buffering effects of different sources of social support in reducing the risk and stress are complex. It is apparent that the different effects of social support on outcome variables of interest that are relevant to individual's

health and well-being need further examination. Especially, this study attempts to clarify the relationships between social support and alcohol-induced stress for the different sources of support identified by Koeske and Koeske (2002) in the stress buffering process. The findings of this study will yield information that may encourage practitioners to take a more active approach to social support in stressful situations among substance abusers.

C. Types and Sources of Social Support

The definition of social support varies depending on the emphasis of the research being conducted. Researchers in the area of social support have proposed a number of different multidimensional models of social support.

1. Types of Social Support

The typology of support which is the most useful conceptualization may vary depending on the characteristics of the population being studied as well the stressors of interest. Since different types of support may impact differently on personal-social problems, type of support should be considered as a particularly critical dimension in the social support literature (Nath, Borkowski, Whitman, & Schellenbach, 1991). According to Hamilton and Sandelowski (2004), social support has been conceived as being comprised of (1) emotional support, (2) practical support, and (3) informational support.

Emotional Support

According to Moss (1973), social support is a ‘subjective feeling of belonging, of being accepted, of being loved, of being needed, all for oneself and not for what one can do’. Kahn and Antonucci (1980) described emotional support as the provision of caring, empathy, love and trust. Birch (1998) defined emotional support as demonstrating care

or sympathy toward another person or listening to someone or just being there when a person needs a friend. Many investigators assessing emotional support relied on items concerning providing or receiving intimate interaction and social companionship (Nyamathi, Leake, Keenan, & Gelberg, 2001). House (1981) noted that emotional support is the most important form of social support and that a person's reaction to receiving it is almost always positive.

Practical Support

Practical support is clearly distinguished from emotional support in that it involves instrumental behaviors that directly assist the person in need. Birch (1998) defined practical support as providing a person with an object or a tangible resource. Tangible support is described as concrete assistance such as giving financial assistance or performing assigned work for others. Additionally, Tilden and Weinert (1987) described instrumental support as the provision of tangible goods and services, or tangible aid. Other researchers assessed practical support by asking questions about providing or receiving advice, information, material assistance, and physical assistance (Nyamathi, Leake, Keenan, & Gelberg, 2001). Cohen and Wills (1985) noted that providing practical help to persons in time of crisis or illness is particularly important.

Informational Support

According to Helgeson and Cohen (1996), informational support has been studied less frequently than either emotional or practical support. Informational support is defined as that information provided to another during a time of stress (Langford, Bowsher, Maloney, & Lillis, 1997). Informational support includes providing information that individual can use in coping with stress. When types of informational

support have been examined, the focus has been on types of information available from formal educational programs or support groups (Hamilton & Sandelowski, 2004). For example, Delaney, Grube, Greiner, Fisher, and Ragland (2002) examined the influence of social support from supervisor on after-work drinking. They found that less social support from supervisor would increase alcohol consumption in a sample 1,974 transit operators.

2. Sources of Social Support

Researchers conceptualized social support as a generalized resource available from one's network of acquaintances that helped one to deal with everyday problems or more serious crises. They then studied whether a greater amount of social support led to increased health, happiness, and longevity of life (Walker, Wasserman, & Wellman, 1994). However, social support among substance abusers is complex and multidimensional. Research aimed at understanding the impact and importance of social support in this population has been contaminated by the inconsistent influence of particular source of social support. One of purposes of this study is to explore the effect that perceiving support from a particular source in this population. As noted previously, measuring different sources of social support is important because there may be a fundamental difference between a person whose network has a wealth of resources to share and one whose network has almost no resources to share. The present study used data to investigate the use and helpfulness of social support sources in coping with a particular life stress: alcohol-induced stress.

Family/Relatives

As the primary psychosocial environment, family and relatives tend to serve consistently as helpful support sources that can effectively deal with life's problems. According to Pilisuk and Parks (1983), the healthy family environment produced in its members positive beliefs about self-worth and self-efficacy.

Brown, O'Grady, Battjes, and Katz (2004) have reported that social support from family motivates drug users for treatment and moves them to a stage of drug abuse treatment readiness. Many studies have reported a beneficial effect of social support from family on adolescent substance use (Barrera, Chassin, & Rogosch, 1993). Adolescents who have close and supportive relationships within the family tend to associate with non-drug-using peers, which decreased their risk for alcohol and drug use (Mason & Windle, 2001). Barrera, Chassin, and Rogosch (1993) found that support from parents, but not siblings or best friends, was strongly related to adolescents' reports of substance use.

Among married individuals, the help that made a difference came from their spouses/partners and close relatives. A large body of literature has focused on considerations of spousal support (Lee & Duxbury, 1998). Mermelstein, Lichtenstein, and McIntyre (1983) found that successful abstainers lived with spouses who were significantly more supportive than did individuals who never quit or relapsed at the follow-up. According to Crnic, Greenberg, Ragozin, Robinson, and Basham (1983), intimate spousal support was more beneficial than the support from community members or friends. According to Thomas, et al. (1997), spousal supports such as emotional support, esteem support, and tangible support predicted negative life events in a negative

direction. In a study of social support systems of substance-using women (N=100), half of the women said that their partners provided them social support and encouraged them to stop using drugs (Falkin & Strauss, 2003). Galanter, Dermatis, Keller, and Trujillo (2002) found that 47 cocaine-dependent subjects reported their spousal support was effective in enhancing the outcome of professional therapy.

Friends

Friends have also been found to be an important source of social support (Miller & Darlington, 2002). Some people's networks are relatively dominated by friends compared to other's networks. For instance, in a study using 45 families with children at risk of disruption, Tracy (1990) suggested that friends were the most frequently reported sources of practical support, emotional support, and information support. In particular, Wellman and Wortley (1990) reported that friends tended to be the most likely supporters to provide companionship. Lee and Duxbury (1998) found that the majority of study participants had friends who provided both emotional and practical support in family needs. Especially, perceived social support from friends significantly moderated the relationship between family history of alcoholism and alcohol use in a young adult sample of children of alcoholics (Ohannessian & Hesselbrock, 1993). In contrast, perceived social support from family members did not moderate any of the relationships examined.

Alcoholics Anonymous (AA) Involvement

Substance abusers are more likely to maintain abstinence in highly supportive settings where abstinence is encouraged (Jason, Olson, Ferrari, Layne, Davis, & Alvarez, 2003). AA is the most common source of help sought for alcohol-related problems

(Kaskutas, Bond, & Humphreys, 2002). Jason et al. (2003) found that AA creates social support networks that provide encouragements for maintaining abstinence from using drugs and alcohol. More specifically, Humphreys and Noke (1997) reported that the positive relationship between AA involvement and less frequent substance use was explained by social networks made up of friends for abstinence. In a study of using 30 chemical dependent women, Huselid, Self, and Gutierrez (1991) found that social support from AA sponsor was significantly correlated with program completion. Those who perceived that they receiving a considerable amount of helpful support from an AA sponsor spent more time in the program and were more likely to complete the program successfully. In addition, AA research suggested that sponsoring another member is the strongest correlate of abstinence (Zemore & Kaskutas, 2004).

Workplace Social Support (Employer/Co-Worker)

Workplace social support from employer, manager, or coworkers may be useful because individuals spend substantial time at work. According to Lee and Duxbury (1998), employed workers stressed the importance of supportive supervisors and had co-workers who provided both emotional and practical support in balancing the demands of work and family. Many studies found social support from coworkers and supervisors was negatively associated with negative outcomes due to perceived stress (AbuAlRub, 2004; Agents, Karlin, Brondolo, & Schwartz, 2003; Morano, 1993). For example, Delaney, Grube, Greiner, Fisher, and Ragland (2002) examined the influence of social support from supervisor on after-work drinking. They found that less social support from supervisor would increase alcohol consumption in a sample 1,974 transit operators. Himle, Jayaratne, and Thyness (1989) found that social support from co-workers was

associated with lower levels of work-related stress and mental health problems. Similarly, Jayaratne et al. (1983) conducted a study to ascertain the effects of support on stress and strain in MSW-level social workers and confirmed a clear negative relationship between supervisor support and worker stress. In addition, workplaces have begun to develop employment support policies and programs to facilitate employees' abilities to handle work and family responsibilities and as a result, to enhance their work performance, organizational commitment, and job satisfaction (Bowen, 1988; Galinsky, Friedman, & Hernandez, 1991). More specifically, the most commonly available benefits were extended maternity leaves and flexible work hours. Employees identified flexible work hours and workplace child care as preferred organizational supports (Lee & Duxbury, 1998).

Religious Social Support (Church Member/Church Clergy)

Many studies found that individuals with strong religious or spiritual beliefs are less likely to drink alcohol or use drug (Kaskutas, Turk, Bond, & Weisner, 2003). According to Roland and Kaskutas (2002), religious involvement is considered to influence substance use by offering distractions to problems through prayer and social support from church members and clergy. Religiousness is thought to serve as a protective role in treating alcohol and other drug problems.

Church members and clergy can play important supportive roles in individuals' lives. Historically, clergy members served their congregants through pastoral care such as counseling, visiting the sick, and crisis intervention. Additionally, congregations take a major role in caring for the needs of people and congregations. They are vital to informal care (Cnaan & Boddie, 2001). Often the first response is a modest financial

support and, if needed, longer term help or even referrals to secular social services. In a study of Cnaan and Buddie (2001), they found congregations are also highly involved in caring for people with addictions.

One of purpose of the present study is to contribute to more precise understanding of the specific nature of the sources of social support experienced by substance abusers. This study investigates whether some sources and types of support are more beneficial than others. There is not much information on this issue. The present study explores different types of social support and assess both emotional and practical support for a better understanding of influence of sources of social support on health and well-being.

D. Conceptual Framework and Hypotheses

The idea that stress affects health and well-being is widely accepted by the public and among many researchers (Turner & Lloyd, 2004). Empirical studies have demonstrated direct associations between life stress and negative physical and mental health consequences (Aldwin, 1994; Edwards & Besseling, 2001; Kendler, Karkowski & Prescott, 1999; Unger et al., 2001).

According to Peyser (1982) and Sayette (1999), alcohol or drugs do not merely function to relieve tension, anxiety, depression, and other stress, but as the pattern progresses into dependency drinking and using become a source of stress. Individuals with substance abuse tend to use drinking as a coping strategy, but drink itself cause additional problems that elevate stress levels, and the drinker is caught in a vicious circle. That is, they drink to feel better but in fact feel worse, which leads to further alcohol to appease the psychological pain (Courbasson, Endler, & Kocovski, 2002). Such behavior

may be dangerous or embarrassing, diminishing the alcoholic's self-esteem, and may drive away friends, employers, co-workers, family, lovers, etc. Although alcohol may be taken initially to increase socialization, isolation is the usual, later result of the disorder, with disruptions in and loss of job, personal, and social relationships (Peyser, 1982).

Stress associated with substance abuse, including arguments or fights with family or friends, feeling completely alone or isolated, nervousness and anxiety, difficulty in thinking clearly, suspicious and distrustful of people, problems harder to handle, and legal consequences of drinking may have harmful consequences, some of which directly affect mental or physical health. Others, such as loss of a job or divorce, have an impact on individual life satisfaction. This study is designed to address this secondary stress in adult substance abusers.

The stress-coping theory of Lazarus and Folkman (1984) states that people under stress first appraise the severity of the consequences of a stressor (primary assessment) and the available resources and possible coping strategies (secondary assessment) secondly. Coping resources may have either direct positive effects on health or may indirectly enhance health by facilitating effective coping behavior (Heaney, Price, & Rafferty, 1995). The substance abusers' use of coping resources to manage a stressful life may reduce the negative impact of secondary stress on their well-being, whereas their lack of coping resources may increase the negative impact of secondary stress.

The social support model provides powerful tools to understand how the complexities of social ties and network affect psycho-social outcomes. Social support has been recognized as an important coping resource for persons experiencing life stress (Mallinckrodt & Bennett, 1992). Lazarus and Folkman posits that social support has

beneficial effects because the availability of supportive functions from other persons helps an individual to deal better with problems (Wills & Cleary, 1996). In the context of problem drinking and drug misuse, it is posited that emotional or practical support from family or friends may help substance abusers to cope with problems from school, home, or work domains and may help them deal with emotional states such as anxiety, depression, or anger. According to Cunningham, Sobell, Sobell, and Kapur (1995), people who abuse alcohol or drugs often report that the decision to finally pursue treatment was prompted either by the direct influence of concerned significant others, or by their acting in concert with courts, employee assistance programs, or informal social networks (Smith, Laframboise, & Bittinger, 2002). Coping resources can moderate the negative effects of stress and help an individual reduce the impact of stressors. Stress-coping theory provides the theoretical underpinning for the buffering model, which suggests that high levels of social support protect the individual against the deleterious impact of stress on health (Stroebe et al., 1996).

According to Pearlin et al (1981), life stress paradigms examine interrelationships among three conceptual domains: (1) sources of stress, (2) mediators of stress and/or moderators of stress, and (3) outcomes of stress (Copeland, 2000). The focus of this study is on alcohol-induced stress as a specific source of stress, perceived availability of social support as a moderator of stress, and three negative outcomes of alcohol-induced stress that are relevant to an individual's health and well-being.

The current study measures the amount of alcohol-induced stress, well-being and health, and social support in outpatient adult substance abusers to examine the hypotheses that:

- H1a: Higher levels of perceived alcohol-induced stress will associate with lower life satisfaction.
- H1b: Higher levels of perceived alcohol -induced stress will associate with higher depressive symptoms.
- H1c: Higher levels of perceived alcohol -induced stress will associate with higher physical health problems.
- H2a: Social support will have a direct positive impact on life satisfaction.
- H2b: Social support will be negatively associated with depressive symptoms.
That is, those who report higher social support will report less depressed.
- H2c: Social support will be negatively associated with physical health problems.
That is, those who report greater social support will report better physical health.
- H3a: Life satisfaction is a function of the interaction between perceived alcohol -induced stress and social support such that the effect of perceived alcohol -induced stress on quality of life is reduced when social support is high.
- H3b: The level of depressive symptoms is a function of the interaction between perceived alcohol -induced stress and social support such that the effect of perceived alcohol -induced stress on depressive symptoms is reduced when social support is high.
- H3c: Health problems are a function of the interaction between perceived alcohol -induced stress and social support such that the effect of perceived alcohol -induced stress on health problem is reduced when social support is high.

III. METHOD

A. Participants

The present study based on a secondary analysis of data collected for the Gateway Rehabilitation Center Study (GRCS), which studied the effects of perceived social support in adult substance abusers. Gateway Rehabilitation Center has been providing comprehensive care for chemically dependent people for 30 years. Gateway offers a variety of services in multiple locations and GRC's data came from both inpatients and outpatients from two of the largest locations. All clients admitted to these locations were asked to participate and refusal rate was very low (only two participants refused to participate in this research project). This convenience sample has included everyone admitted to these programs between May 2003 and July 2004. Additionally, the quantitative design includes a self-administered questionnaire that measured severity of drug and alcohol problems, quality of life, mental health, physical health problems, religion and spirituality, perceived social support, affiliation of self-help group, and demographic information.

This study utilized data from the time-one survey of the Gateway Rehabilitation Center Study (GRCS) to analyze the relationship between alcohol-induced stress and the negative outcomes such as depressive symptoms, health problem, and low life satisfaction. The sample of the present study is 330 inpatient and outpatient adult substance abusers who participated between May 2003 and July 2004 in time one survey of GRCS. Participants consisted of 44.5 percent of the participants were female and 55.5 percent were male; 19.9 percent of participants were married, 53.1 percent were never

married; 37.7 percent of participants were employed, 53.7 percent were unemployed and 3.1 percent were never worked.

B. Procedure

After approval of the study by the Institutional Review Board (IRB) of the University of Pittsburgh, all clients were surveyed during scheduled group meeting time. The researcher and administrative staff surveyed groups twice a month and outpatient groups once a month. As noted previously, subjects' drop out rate was not high. The purpose of the study was to evaluate treatment effectiveness and the researcher and research project staff outlined the research project intention to participated clients. Participants were asked to complete the questionnaires in a quiet area and each research packet included a pen, a series of questionnaires, and the consent form. Participants agreeing to participate in the study were asked to sign the informed consent document prior to completing the questionnaire. The informed consent includes potential risks, benefits, the right to withdraw from treatment, and emergency contact procedures. Only the researcher knew the identity of the client based upon the signature on the consent form. Questionnaires were administered by the researcher after the informed consent procedure was completed. Additionally, the researcher inquired if the participants experienced any confusion, stress, physical discomfort or other harmful consequences from the assessment procedure. For example, the research project staffs were available to assist participants to interpret questionnaire. The approximate time for completing the questionnaires was 40 minutes.

C. Measures

The present study used six self-report questionnaires for data collection: The Inventory of Drug Use Consequences (InDUC; Tonigan & Miller, 2002); the Sources of Social Support (SOSS; Koeske & Koeske, 2002); Quality of Life Index (QLI; Ferrans & Powers, 1985); the World Health Organization Disability Assessment Schedule II – Second Version (WHODAS-II; WHO, 2001); the Center for Epidemiologic Studies Scale (CES-D; Radloff, 1977); and a demographic measure.

1. The Inventory of Drug Use Consequences (InDUC; Tonigan & Miller, 2002)

For purposes of this study, substance abuse-induced stress has been identified as an acute and chronic psychological or behavioral risk condition due to drug and alcohol abuse (Peyser, 1982; Rose & Zweben, 2002; Sayette, 1999; Smyth, 1998; Turner & Lloyd, 2003). In addition, substance abuse-induced stress is conceptualized as a particular type of stress occurring in personal contexts which leads to chronic emotional exhaustion, depersonalization and reduced sense of personal accomplishment. Of particular importance are the consequences of substance abuse-induced stress, including health disorders, job productivity losses, accidental injuries, spouse/family problems, criminal behavior, attempted suicide, and the spread of sexually transmitted diseases (Rose & Zweben, 2002; Smyth, 1998).

Substance abuse-induced stress will be measured using the Inventory of Drug Use Consequences (InDUC; Tonigan & Miller, 2002). The InDUC is a self administered scale which measure negative consequences of alcohol and drug use. The 50-item InDUC is intended to measure five subscales related to (1) Impulse Control; (2) Social Responsibility; and (3) physical, (4) Interpersonal, and (5) Intrapersonal domains for

lifetime and recent consequences. Item examples are “I have taken foolish risks when I have been drinking or using drugs (Impulse Control), “I have missed days of work or school because of my drinking or drug use” (Social Responsibility), “My physical appearance has been harmed by my drinking or drug use” (Physical), “A friendship or close relationship has been damaged by my drinking or drug use” (Interpersonal), and “I have felt bad about myself because of my drinking or drug use”(Intrapersonal). This study will investigate only InDUC items referring to recent alcohol and drug related consequences. Participants indicated on a 4-point scale from 0 (never) to 3 (daily or almost every day) how often during the past 3 months they behavior or event occurred.

The range of the total score is 0-150 with a higher score representing more negative consequences and presumed life stress. InDUC showed fairly good reliabilities (Tonigan & Miller, 2002). According to Blanchard et al. (2003), internal consistency of the full measure using Cronbach’s alpha coefficient was very high (.96), and its subscale reliabilities were .77 (Physical), .34 (Intrapersonal), .89 (Social Responsibility), .75 (Interpersonal), and .93 (Impulse Control), respectively. Four of the five InDUC subscales had good-to-excellent test-retest stability. InDUC demonstrated good construct validity. For example, InDUC was significantly related to frequency of substance use, alcohol and drug severity, number of dependence symptoms met for primary disorder, and psychiatric severity (Blanchard et al., 2003). The InDUC has consistently shown good reliability and the present study also showed a good reliability, .96 with 50 items referring to recent alcohol and drug related consequences.

2. The Sources of Social Support (SOSS; Koeske & Koeske, 2002)

Sources of Social Support (SOSS; Koeske & Koeske, 2002) scale was used to measure emotional and practical social support from various sources of social support, such as spouse/partner, parents, friends, employer, co-workers, therapist/counselor/case manager, AA sponsor, and people at my church or synagogue.

The general (G) form of the SOSS and an alcohol-specific (AS) form was used to assess perceived availability of social support on an alternating basis. Although most measures of social support address general features such as emotional or instrumental support, few studies have examined the relative strength of general versus alcohol specific support in drug and alcohol area (Beattie & Longabaugh, 1999). The alcohol-specific form included the statement, “Rate how much support is available to you for dealing with your alcohol problem, staying abstinent, and having a successful recovery,” which was absent from the general form.

The scale is a 5 point scale, range from 1 (None At All) to 5 (A Great Deal). Scores will be summed across the 12 sources to obtain practical support and emotional support. An overall support score was obtained by summing the emotional support and practical support scores. Thus, the range for overall score is 2-10, whereas the range for both emotional support and practical support is 1-5.

The test-retest coefficients over an 8-week interval were .58 (emotional support), .62 (practical support), .62 (total support), respectively. The SOSS was related to the Inventory of Socially Supportive Behaviors (ISSB; Barrera, 1981) which measures social support ($r=.49$, $p<.001$) (Koeske & Koeske, 2002). Additionally, the strength of this scale is the evidence for theoretical construct validity of the SOSS measure. Koeske

and Koeske (2002) confirmed that the SOSS could be used to measure direct and interactive effects of social support in addressing stress theoretical issues. For example, they found significant buffering interactions of SOSS measured support in the relationship between stress and outcomes such as life satisfaction, burnout, and mental health symptoms. The reliabilities of the emotional, practical, and total social support were high, .83, .88, and .93, respectively.

3. Quality of Life Index (QLI; Ferrans & Powers, 1985)

Ferrans & Powers' Quality of Life Index (QLI) was used to assess overall quality of life (Ferrans & Powers, 1985). Quality of life is defined as "a person's sense of well-being that stems from satisfaction or dissatisfaction with the areas of life that are important to him/her" (Ferrans, 1990). The QLI reflects the respondents' satisfaction with the aspects of life they value and includes 33 questions that encompass the four domains of quality of life: health and functioning, socio-economic, psychological/spiritual, and family. Item examples are "How satisfied are you with your health?" (Health and Functioning), "How well you can take care of your financial needs?" (Socio-Economic), "How satisfied are you with your peace of mind?" (Psychological/Spiritual), and "How satisfied are you with the emotional support you get from your family?" (Family). The instrument is a two-part questionnaire: (1) one section measures satisfaction with each identified domain and (2) the other measures the importance of each domain for the subject.

Only the first section that measures satisfaction with each element of quality of life was used. Scores on this scale was summed across 30 items rated on a 6-point scale

(from “1 = very dissatisfied” to “6 = very satisfied”), with higher scores indicating more life satisfaction.

Internal consistency, measured by Cronbach’s alpha, was supported ranging from .84 to .98 for the entire instrument, from .70 to .93 for the health and functioning subscale, from .71 to .92 for the social and economic subscale, and from .80 to .93 for the psychological/spiritual subscale. For the family subscale, alphas were supported, ranging from .63 to .92 (Ferrans, 1990; Schreier & Williams, 2004). Test-retest reliability varied from .87 with a two-week interval to .78 with a three to four-week interval (Ferrans & Powers, 1985; Rustoen et al., 1999; Schreier & Williams, 2004).

Content validity of the QLI was supported by the fact that items were based both on an extensive literature review of issues related to quality of life and on the reports of patients regarding the quality of their lives (Ferrans & Powers, 1985). The overall QLI score and a measure of satisfaction with life were highly correlated (Ferrans & Powers, 1985; Ferrans & Powers, 1992). The reliability of the 30-item scale was .93.

4. The World Health Organization Disability Assessment Schedule II (WHODAS-II; WHO, 2001)

Self-reported physical health was assessed using the World Health Organization Disability Assessment Schedule II — Second Version (WHODAS-II) multidimensional measure of health. The WHODAS-II is a new research tool that has been developed to evaluate the activity limitations and participation restrictions actually experienced by an individual across disorders, languages, and cultures (Ertugrul & Ulug, 2004; McKibbin, Patterson, & Jeste, 2004).

This instrument seeks to determine the amount of difficulty encountered in activities that a person actually does as opposed to those he/she would like to do or those he/she can do, but does not. Respondents are asked to think back over the last 30 days and answer the questions thinking about how much difficulty they had doing the various activities. Having difficulty with an activity, in this instrument, means increased effort, discomfort or pain, slowness, or changes in the way the person does the activity (Gallagher & Mulvany, 2004).

The instrument has six major domains encompassing activities that are considered important in life. These are: 1) understanding and communicating with the world; 2) moving and getting around; 3) self-care; 4) getting along with people; 5) life activities; and 6) participation in society. Item samples are “Generally understanding what people say?” (Understanding and Communicating), “Getting out of your home?” (Moving and Getting around), “Washing your whole body?” (Self-Care), “Making new friends?” (Getting along with people), “Getting your household work done as quickly as needed?” (Life activities), “How much of a problem did you have because of barriers or hindrances in the world around you?” (Participation in society). The response category for individual domain items is a five-point scale from “none” (1) to “extreme/cannot do” (5). Lower scores are indicative of a higher level of ability and functioning whereas higher scores are indicative of increased levels of difficulty. Current scoring for the WHODAS-II is based on averaging responses for each domains as well as an overall score based on a summation of the six domains.

Chopra, Couper, and Herman (2004) and McKibbin, Patterson, and Jeste (2004) reported fair test-retest stability over 12 week interval, ranging from .32 to .80.

Correlational analyses provided support for construct validity of the WHODAS-II. The WHODAS-II was positively and significantly associated with the severity of depressive symptom ($r = .36, p < .01$). Specifically, WHODAS-II subscales of understanding and communicating ($r = .34, p < .01$) and life activities ($r = .32, p < .01$) were positively correlated with scores of general psychopathology (McKibbin, Patterson, & Jeste, 2004). The WHODAS-II correlated ($r = -.63$) with the Quality of Well-Being (Kaplan et al., 1989). The reliability of the 30-item scale was .94.

5. The Center for Epidemiologic Studies Scale (CES-D; Radloff, 1977)

The psychological well-being, particularly depression, was measured with the Center for Epidemiologic Studies Scale (CES-D; Radloff, 1977). The CES-D is considered a valid and reliable measure for use with the general population (Radloff, 1977). Respondents indicate how frequently statements like “I had crying spells” and “I had trouble keeping my mind on what I was doing” describe them on a scale ranging from 0 (rarely or none of the time) to 3 (most or all of the time). Four positively-worded items (4, 8, 12, and 16) were reverse scored and responses are summed to create scale scores. An individual’s CES-D score is the sum of all 20 item’s scores after the four positively-worded items are scored in reverse. The possible range of CES-D score is 0 to 60. Higher scores indicate more depressive symptoms. A score of 16 indicates depression at a level enough to cause impairment of functioning and is sometimes used as a criteria for a clinical level of depression. The internal consistency reliability (Cronbach’s alpha) of the CES-D in previous research ranged from .84 to .90 (Chang, 2001; Radloff, 1977). A test-retest reliability coefficient of .54 was attained after a six-month time interval (Nordgren, 1995). According to Shinar et al. (1986), the CES-D is

significantly correlated with other depression and mood instruments ($r = .57$ to $r = .82$, $p < .01$). The scale yielded a coefficient alpha of .82.

6. Demographic Information

Questions about demographic characteristics in the present study include: sex, age, race (Caucasian, Hispanic, African American, American Indian, Asian, and Other), marital status (Never married, Living together/unmarried, Married, Separated, Divorced, and Widowed), educational level (Less than 12th grade, GED, Partial college/technical/business, College graduate, Partial graduate, and Graduate or Professional Degree), and employment status (Never worked, Currently unemployed, Full time, Part time, Military, and Other). These variables provide specific characteristics of the sample.

D. Data Analysis Plan

Moderated regression analysis (MRA) and structural equation modeling (SEM) approach in estimating interaction effects were used to analyze the main effects among the variables and to test the moderating effects of social support on the three dependent variables.

Moderated Regression Analysis

Before moderated regression analysis is performed, intercorrelations among the independent and moderator variable were analyzed to detect possible presence of multicollinearity. The moderated regression model analyzes the main effect of independent and moderator variable and the independent x moderator interaction for testing research hypothesis. A series of multiple regression analyses was conducted to

assess the presence of significant interactions between substance abuse-induced stress and social support on three outcome variables.

SEM Analysis

In order to determine whether social support moderates the effect of substance abuse-induced stress on three outcomes, the associations were tested in two subgroups of participants, participants with high versus low levels of support, based on a median split on a measure of social support.

One method of testing moderating effects of social support on three outcomes is a multigroup Structuring Equation Modeling (SEM), where the levels of the moderator are treated as different groups (i.e., low vs high) and the equivalence of the structural relations between substance abuse-induced stress and three outcomes is compared across the two groups.

The moderation effects of social support on three outcomes are examined to determine whether the same structural equation model is consistent across both groups. The baseline model is a fully unconstrained model (i.e., there are no constraints placed in the model to test for differences between the low and high social support groups). When the model is constrained to be equal in the two subgroups, the models are used to compare the goodness-of-fit statistics.

The fit of the model is assessed by multiple indices. Chi-squares and degree of freedom are reported. A not significant χ^2 indicates that the model fits the data. Two measures of fit are used to supplement the χ^2 : the comparative fit index (CFI) and the root mean square error of approximation (RMSEA). A model that meet the criteria of a CFI of $>.95$ and a RMSEA value of under $.06$ is considered a good fit.

The number of differences between the group's parameter estimates raised the question of statistical significance, which could be determined by comparing the chi-square statistic of the baseline model with chi-square of a model in which some parameters are constrained so that they are equal across groups. If the constrained model had a significantly worse fit than the unconstrained baseline model, then this indicates that constraining the model to be equal for the low and high support subgroups is not reasonable, supporting the premise of moderation. A significant difference in the chi-square statistics would be attributable to the constrained parameters.

This is one of two methods the current study uses to determine whether social support moderates the effect of substance abuse-induced stress on three outcomes. That is, evidence of a buffering effect of social support present whenever the models with different structural coefficients for high- and low-social support proved to be a significant improvement over the paired models with coefficients constrained to be equal.

IV. RESULTS

This chapter details the results of data analyses. The purpose of the analyses is to explore this alcoholic treatment sample on stress, social support, and three outcome variables of depression, physical health problems, and life satisfaction in the expected relationships. The analyses also test whether availability of perceived social support would buffer the impact of stress due to alcohol abuse on three outcome variables.

Descriptive statistics will be presented to describe the relations of stress, support, and outcomes in the total sample prior to the results of the hypothesis testing. Three types of statistical analyses were conducted to evaluate the study's central purposes. Correlations were reported to evaluate the relationships between the primary testing variables and the three outcome variables. Especially, examination of social support in an alcohol abuse sample was conducted to explore the roles of both overall and separate sources of social support in relation to three outcome variables. In addition, moderated regression analyses were used to evaluate study hypotheses of a buffering effect of social support. In the moderated regression analysis, demographic variables were entered as one block in the regression. The main effects of stress due to alcohol abuse and social support were entered as the second step; then, the interaction product term (stress \times social support) was entered as the third step.

To obtain more reliable moderating effects on the three outcome variables, structural equation modeling using a multisample analysis was additionally performed.

A. Participant Characteristics

Three hundred thirty individuals participated in this study. Data on 326 individuals were analyzed. Four participants were excluded because these individuals did not complete large sections of various measures. Table 1 shows the demographic characteristics of the final 326 participants.

The age of the participants ranged from 18 to 60. The mean age was 33.64 years (SD=10.77). Of the 326 participants, 145 (44.5%) were female and 181 (55.5%) were male. The participants were predominantly Caucasian (294; 90.2%), 22 were African American (6.7%), 3 were Hispanic (0.9%), 2 were American Indian (0.9%), and 3 (0.9%) of the respondents checked other. Of the 156 (48.8%) had finished high school or acquired a GED, 38 (11.7%) had graduated from college, 11 (3.4%) had experienced graduate or professional education beyond college, and 21 (6.4 %) had graduate or professional degree. Only 65 (19.9%) of participants were currently married and 173 (53.1%) were never married. Twenty two participants (6.7%) were living together and 37 (11.3%) of participants had experienced divorce. Of the participants, 123 (37.7%) were employed, 165 (53.7%) were unemployed, and 10 (3.1%) were never worked.

Of the participants, 158 (48.5%) used only alcohol, 144 (44.2%) were polydrug users (alcohol or any other drug), and the remaining 24 (7.3%) did not respond.

Table 1. Demographic Characteristics of Participants (N = 326)

Variables	Frequency	Percent	M	SD
Age	326 Min. = 18 Max. = 60		33.64	10.77
Gender				
Female	145	44.5		
Male	181	55.5		
Race				
White	294	90.2		
Non-white	32	9.8		
Marital Status				
Married	65	19.9		
Other	261	80.1		
Education				
Less than 12 th grade	124	39		
GED	32	9.8		
Partial college /technical/business	92	28.2		
College graduate	38	11.7		
Partial graduate /professional school	11	3.4		
Graduate or professional degree	21	6.4		
Employment Status				
Employed	123	37.7		
Other	203	62.3		
Type of pathology				
Alcohol only	158	48.5		
alcohol + other substance	144	44.2		
Missing	24	7.3		

Note: There are missing information for some variables so totals are not all 326.
Dichotomous variables were coded as follow: Gender: 1 = female, 2 = male; Race: 1 = white, 2 = other; Marital status: 1 = married, 2 = other; Employment: 1 = employed, 2 = other; Type of pathology: 1 = alcohol only, 2 = alcohol + other substance.

B. Descriptive and Psychometric Findings of Study Variables

The data from this sample were evaluated for accuracy of entry, normality of distribution, and outliers to data analysis. Values for all of the study variables were verified to fall within the possible range of the measures they were based on. Skewness and kurtosis were reviewed to detect whether they would be in an acceptable range of $\pm .80$. In this section, the mean, standard deviation, skewness, and kurtosis of the instruments are reported. These data are summarized in Table 2.

Table 2. Mean, Standard Deviation, Skewness, and Kurtosis of the Instruments

Instruments	Mean	SD	Skewness	Kurtosis
Alcohol abuse-induced stress	1.50	.22	-.87/.55	.50/-.14
Life satisfaction	3.74	.96	-.09	-.36
Depression	24.43	13.33	.38	-.61
Physical health problems	2.13	.66	.31	-.68
Total social support	6.90	1.73	-.11	-.75
Emotional support	3.58	.87	-.25	-.67
Practical support	3.32	.96	-.07	-.76
Spouse/Partner/Lifemate	7.59	2.69	-.85	-.59
Parents	8.16	2.38	-1.30	.67
Children	7.82	2.60	-.96	-.32
Relatives	7.02	2.67	-.46	-1.01
Friends	6.57	2.47	-.27	-.86
Neighbors	4.38	2.62	.85	-.47
Employer	5.96	3.05	-.02	-1.49
Co-Workers	5.57	3.06	.18	-1.43
Clergyperson	5.83	3.22	.07	-1.59
People at my church or synagogue	5.49	3.15	.21	-1.53
Therapist/Counselor/Case manager	8.24	1.96	-.91	-.02
AA sponsor	7.94	2.46	-1.03	-.04

Note: Scores on alcohol abuse-induced stress were inverted and log to achieve a more nearly normal distribution. They were then reinverted so that high values reflected greater stress.

1. Alcohol Induced Stress (AIS)

AIS had mean of 1.50 and the standard deviation was .22 (skewness = -.87, kurtosis = .50). Participants indicated that AIS has happened between a few time and twice a week during the past 3 months. Because the AIS scale was negatively skewed, the scale was transformed using a square root method. After transformation, the skewness of the scale was improved to .55. Scores on alcohol abuse-induced stress were inverted and log to achieve a more nearby normal distribution. They were then reinverted so that high values reflected greater stress.

The three items that alcoholics identified as the most stressful consequences due to their alcohol abuse were, “Because of my drinking, I have not had the kind of life that I want” ($M = 2.44$), “My family has been hurt by my drinking” ($M = 2.36$), and “I have spent too much or lost a lot of money because of my drinking” ($M = 2.33$).

The three items that participants identified as the least stressful consequences due to their alcohol abuse were, “While drinking or intoxicated, I have injured someone else” ($M = .54$), “I have been overweight because of my drinking” ($M = .57$), and “I have been arrested for driving under the influence of alcohol” ($M = .75$).

2. Life Satisfaction

Ferrans & Powers’ Quality of Life Index (QLI) was used to assess overall life satisfaction. The QLI reflects the respondents’ satisfaction with aspects of life, such as health and functioning, socio-economic, psychological /spiritual, and family. The mean score of the QLI in the current study was 3.74 (1 = very dissatisfied to 6 = very satisfied), and the standard deviation was .96. According to Rudolf and Watts (2002), patients with alcohol problems report a lower life satisfaction than healthy people and in some domains

lower than patients suffering from physical and persistent illness, such as diabetes or heart failure. In fact, the present population reported lower life satisfaction than hemodialysis patients ($M = 4.30$) (Ferrans & Powers, 1992).

The highest satisfaction was reported for “The emotional support you get from your family” ($M = 4.61$), “Your ability to take care of yourself without help” ($M = 4.51$), and “The emotional support you get from people other than your family” ($M = 4.35$).

The three items that participants identified as the lowest satisfaction due to their alcohol induced stress were, “Not having a job (if unemployed, retired, or disabled)” ($M = 2.17$), “The amount of worries in your life” ($M = 2.72$), and “How well you can take care of your financial needs” ($M = 2.81$).

3. The Center for Epidemiologic Studies Scale (CES-D) for Depression

Depression was measured with the Center for Epidemiologic Studies Scale (CES-D). Responses ranged from “rarely or none of the time” (0) to “most or all of the time” (3) with the higher scores indicating more depressive symptoms. Approximately 48.1% of the participants answered that their “sleep was restless” and “they felt depressed” at least some of the time (3-4 days) or most of the time (5-7 days) during the past week. “I felt sad” ($M = 1.42$), “My sleep was restless” ($M = 1.43$), “I felt depressed” ($M = 1.49$), and “I felt fearful” ($M = 1.52$) were the items with highest means.

On the CES-D, those scoring 16 or higher may be considered at risk for developing clinical depression. The normative mean for non-clinical subjects is 9.25 ($SD = 8.58$), compared with a mean of 24.42 ($SD = 13.51$) for clinical subjects (Radloff, 1977). In the present sample, the mean depression (CES-D) score was 24.43 and the standard deviation was 13.33 with a range of 0-57 (skewness = .38). The mean score on

the CES-D was substantially higher than the cut-off of 16, the value associated with a diagnosis of clinical depression. Of the participants, 232 (71.2%) scored in this clinical range. Depression is a highly prevalent disorder among alcoholic clients (Bobo, McIlvain, and Leed-Kelly, 1998). The mean reported in this study corresponds with previous findings for people who are seeking recovery from drug or alcohol addiction (Bobo, McIlvain, and Leed-Kelly, 1998; Harmen & Sanderson, 1999).

4. Physical Health Problems

Physical Health Problems was measured with the WHO-DAS-II. It consists of 32 items and the respondent rates the degree of difficulty on a scale of 1 to 5. Participants may rate the level of difficulty experienced as none, mild, moderate, severe or extreme. Lower scores are indicative of a higher level of ability or fewer problems whereas higher scores are indicative of increased levels of difficulty. Physical Health Problems had a mean of 2.13 (SD = .66) with a fairly normal distribution (skewness = .31, kurtosis = -.68). In terms of respondent rate, the mean of 2.13 suggests that participants in this study had between mild and moderate difficulties due to health conditions.

The highest difficulty was reported for “How much of a problem did you have in joining in community activities” (M = 2.64), “Getting all the household work done that you needed to do” (M = 2.59), and “How much of a problem did you have in doing things by yourself for relaxation or pleasure” (M = 2.57).

5. The Sources of Social Support (SOSS)

SOSS scale was used to measure emotional and practical social support from 12 sources of social support. Scores were obtained for each source by summing across the emotional and practical ratings, and for emotional support and practical support by

summing ratings across the sources. An overall score was obtained by summing the emotional and practical scores. The mean score of the total social support was 6.90 with standard deviation of 1.73. Total social support had a fairly normal distribution (skewness = -.11, kurtosis = -.75). Participants in this study were in keeping with the average typically reported in those in the previous studies that used the SOSS. According to Koeske and Koeske (2002), the highest skewness value for the total support score was less than .50, and most of skewness values were below .20. Additionally, the summed-mean score ranged from 5 to almost 7, reflecting a medium amount of support (i.e., “a fair amount”).

Emotional support ($M = 3.58$) was slightly higher than practical support ($M = 3.32$) with each in the range of “a fair amount” and “quite a bit.” Whereas no source provided “quite a bit” or more practical support, 4 sources from spouse/partner life time, children, therapist/counselor/case manager, and AA sponsor provided this level of emotional support. Table 2 also shows that the highest available support ratings were for Therapist/Counselor/Case manager ($M = 8.24$), Parents ($M = 8.16$), AA sponsor ($M = 7.94$), Children ($M = 7.82$), and Spouse ($M = 7.59$).

C. Bivariate Analyses

The bivariate relationships for the primary study variables, including the seven background variables, are shown in the table 3. It is notable that three outcome variables were significantly related.

The bivariate relationships showed that three bivariate hypotheses were significantly confirmed. First, higher levels of perceived alcohol-induced stress were

associated with lower life satisfaction ($r = -.38, p < .001$). Secondly, higher levels of perceived alcohol-induced stress were associated with higher depressive symptoms ($r = .41, p < .001$). Finally, higher levels of perceived alcohol-induced stress were associated with higher physical health problems ($r = .37, p < .001$).

Social support was correlated only with life satisfaction, $r = .23, p < .001$, indicating that those who with higher perceived social support also had better life satisfaction. With respect to the correlation between social support and life satisfaction, the life satisfaction measure has items to reflect basically social support (e.g., “How satisfied are you with your spouse” and “How satisfied are you with the emotional support you get from your family”). However, no relationship was found between the demographic variables and social support except type of pathology ($r = .14, p < .05$). That is, those who with higher perceived social support were more likely to be polydrug user.

Regarding the outcome variables, employed participants indicated not only higher life satisfaction but also lower depression and physical health problems. Depression and physical health problems were correlated with having a prior treatment history.

These result suggested that those with higher degree of pathology had higher depressive symptoms and physical health problems.

With respect to the life satisfaction, marital status ($r = -.14, p < .05$) and employment status ($r = -.18, p < .05$) were correlated with respondents' life satisfaction. Life satisfaction was higher for married and employed respondents. Also, those who use more substance are likely to be lower life satisfaction ($r = -.12, p < .05$).

Table 3. Bivariate Correlation Matrix Among Study Variables

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1. Gender	—											
2. Age	.07	—										
3. Race	.03	.14*	—									
4. Marital Status	-.05	-.33**	-.02	—								
5. Education	.01	.21**	.01	-.23**	—							
6. Employment	-.15**	-.30**	-.04	.23**	-.07	—						
7. Type of Pathology	-.08	-.06	.06	.09	-.08	.11	—					
8. Stress	-.11	.01	-.05	.08	-.04	.10	.21**	—				
9. Physical Health Problem	-.09	.03	-.04	.09	-.02	.13*	.17**	.37**	—			
10. Life Satisfaction	.07	.04	.13*	-.14*	.06	-.18**	-.12*	-.38**	-.57**	—		
11. Depression	-.06	-.00	-.06	.12*	-.07	.16**	.11	.41**	.58**	-.52**	—	
12. Social Support	-.10	-.04	.08	.02	-.09	.05	.14*	.10	-.05	.23**	-.03	—

Note: Dichotomous variables were coded as follow: Gender: 1 = female, 2 = male; Race: 1 = white, 2 = other; Marital status: 1 = married, 2 = other; Employment: 1 = employed, 2 = other; Type of pathology: 1 = alcohol only, 2 = alcohol + other substance.

* $p < .05$; ** $p < .01$.

1. Exploration of Relationships of the SOSS to Three Outcome Variables

Table 4 shows which specific sources of support relate to stress due to alcohol abuse, depression, physical health problem, and life satisfaction. The critical variable related to the largest number of support sources was life satisfaction: it was related significantly to support from spouse, children, relatives, friends, neighbors, employer, and co-worker.

Table 4. Bivariate (Spearman) Correlation of SOSS Sources on Study Variables

SOSS Source	Study Variables			
	Stress	Depression	Life Satisfaction	Physical Health Problem
Spouse	.06	-.19*	.29**	-.20**
Parent	-.11	.01	.05	-.03
Children	-.12	-.03	.16*	-.08
Relatives	-.06	-.03	.21**	-.12*
Friends	.00	-.09	.24**	-.16**
Neighbors	-.04	.01	.16*	-.00
Employer	-.04	-.02	.20**	-.05
Co-Workers	.06	.04	.20**	.01
Clergyperson	-.03	-.03	.11	.01
Church Members	-.08	.08	.12	.12
Therapist/Case manager	-.13*	.04	.02	.11
AA sponsor	-.18*	.02	.02	.00

*p<.05 **p<.01.

This is consistent with overall support correlation being significant. The relationships with physical health problem are also related significantly or marginally to support from spouse, friends, and relatives. Depression was significantly related to support from spouse. Support from one's spouse/partner, relatives, and friends were the

most important in terms of relating to other variables among alcoholics. Additionally, support from therapist/case manager and AA sponsor were significantly related to stress due to alcohol abuse. This finding was not consistent with the discriminant validity of the SOSS and earlier research (Koeske & Koeske, 2002).

2. Predicting Depression, Physical Health Problems, and Life Satisfaction

The study hypothesized that higher levels of perceived alcohol-induced stress would be associated with lower life satisfaction, higher depressive symptoms, and higher physical health problems (H1a, H1b, and H1c).

The study also hypothesized that social support would have a direct positive impact on life satisfaction (H2a). In addition, social support would be negatively associated with depressive symptoms and physical health problems (H2b and H2c).

The regression analyses were used to test whether, and to what extent, the independent variables of stress due to alcohol abuse and perceived availability of social support would predict the outcome variables of depression, physical health problems, and life satisfaction. The regression analyses to test hypotheses 1 and 2 involved two steps. First, in order to control for the effects of the demographic variables, seven variables (gender, age, race, marital status, education, employment status, and type of pathology) were entered as one block in the regression. Second, the alcohol induced stress and social support were entered simultaneously into regression equation.

Prediction of Life Satisfaction

As shown in Table 5, the seven demographic and degree of pathology variables explained 11% of the variance in life satisfaction, $F(7, 232) = 4.02$, $p = .01$. Age ($\beta =$

-.19, $p = .01$), race ($\beta = .17$, $p = .01$), employment status ($\beta = -.18$, $p = .01$), and type of pathology ($\beta = -.14$, $p = .03$) were significant predictors of life satisfaction, indicating that non-white younger participants who were employed and used alcohol only were more likely to show better life satisfaction. At step 2, stress due to alcohol abuse and social support explained 21% of the variance in life satisfaction, $F(9, 230) = 11.69$, $p = .001$. Stress due to alcohol abuse was a significant predictor of life satisfaction ($\beta = -.40$), indicating that those who reported higher levels of perceived alcohol-induced stress would be associated with lower life satisfaction, which confirmed hypothesis H1a.

Table 5. Multiple Regression Analyses for Predicting Life Satisfaction

Model	Variables	B	β	R^2	R^2 INC
1				.11	.11
	Gender	.12	.06		
	Age	-.02	-.19**		
	Race	.55	.17**		
	Marital status	-.18	-.08		
	Education	.02	.06		
	Employment	-.36	-.18**		
	Type of pathology	-.26	-.14**		
2				.31	.21
	Alcohol abuse-induced stress	1.85	-.40**		
	Social support	.15	.26**		

Note: Dichotomous variables were coded as follow: Gender: 1 = female, 2 = male; Race: 1 = white, 2 = other; Marital status: 1 = married, 2 = other; Employment: 1 = employed, 2 = other; Type of pathology: 1 = alcohol only, 2 = any other substance.

* $p < .10$. ** $p < .05$.

Consistent with hypothesis H1a, social support had a positive impact on life satisfaction ($\beta = .26$), indicating that those who reported higher levels of social support

would be associated with lower life satisfaction, which confirmed hypothesis H2a.

Confounded 5 items such as “How satisfied are you with your spouse, lover, or partner?” and “How satisfied are you with the emotional support you get from your family?” with SOSS were removed in the scoring of life satisfaction.

Prediction of Depression

As shown in Table 6, the seven demographic and type of pathology variables explained 7% of the variance in depression, $F(7, 236) = 2.45, p = .02$. Age ($\beta = .19, p = .01$), race ($\beta = -.12, p = .05$), and employment ($\beta = .14, p = .04$) were significant predictors of depression, indicating that older white participants who were not employed showed higher depressive symptoms. At step 2, stress due to alcohol abuse and social support explained 14% of the variance in depression, $F(9, 234) = 6.68, p = .001$. Stress due to alcohol abuse was a significant predictor of life satisfaction ($\beta = .38$), indicating that those who reported higher levels of perceived alcohol-induced stress would be associated with higher depressive symptoms, which confirmed hypothesis H1b.

Unlike the findings from stress due to alcohol abuse, social support was not a significant predictor of depression before or after influential case deletion (before deletion; $\beta = -.07, p = .28$, after deletion; $\beta = -.04, p = .49$). Stress due to alcohol abuse had unique contribution to explain depression in this sample.

Table 6. Multiple Regression Analyses for Predicting Depression

Model	Variables	B	β	R ²	R ² INC
1				.07	.07
	Gender	-.04	-.03		
	Age	.01	.19**		
	Race	-.27	-.12*		
	Marital status	.17	.10		
	Education	-.01	-.05		
	Employment	.19	.14**		
	Type of pathology	.12	.09		
2				.20	.14
	Alcohol abuse-induced stress	-1.24	.38**		
	Social support	-.03	-.07		

Note: Dichotomous variables were coded as follow: Gender: 1 = female, 2 = male; Race: 1 = white, 2 = other; Marital status: 1 = married, 2 = other; Employment: 1 = employed, 2 = other; Type of pathology: 1 = alcohol only, 2 = any other substance.

* $p < .10$. ** $p < .05$.

Prediction of Physical Health Problems

As shown in Table 7, the seven demographic and type of pathology variables explained 7% of the variance in physical health problems, $F(7, 235) = 2.47$, $p = .02$. Age ($\beta = .16$, $p = .03$) and Type of pathology ($\beta = .18$, $p = .01$) were significant predictors of, indicating that older and poly drug user were more likely to show higher physical health problems. At step 2, stress due to alcohol abuse and social support explained 11% of the variance in physical health problems, $F(9, 233) = 5.64$, $p = .001$. Stress due to alcohol abuse was a significant predictor of physical health problems ($\beta = .34$), indicating that those who reported higher levels of perceived alcohol-induced stress would be associated with higher physical health problems, which confirmed hypothesis H1c.

Social support was also a significant predictor of physical health problems at the significant level of .10 ($\beta = -.10$, $p = .09$) in this sample. Social support had a negative impact on physical health problems, indicating that those who reported higher levels of social support would be associated with lower physical health problems, which confirmed hypothesis H2c.

Table 7. Multiple Regression Analyses for Predicting Physical Health Problems

Model	Variables	B	β	R ²	R ² INC
1				.07	.07
	Gender	-.08	-.06		
	Age	.01	.16**		
	Race	-.04	-.02		
	Marital status	.09	.06		
	Education	-.01	-.02		
	Employment	.13	.10		
	Type of pathology	.24	.18**		
2				.18	.11
	Alcohol abuse-induced stress	-1.05	.34**		
	Social support	-.04	-.10*		

Note: Dichotomous variables were coded as follow: Gender: 1 = female, 2 = male; Race: 1 = white, 2 = other; Marital status: 1 = married, 2 = other; Employment: 1 = employed, 2 = other; Type of pathology: 1 = alcohol only, 2 = any other substance.

* $p < .10$. ** $p < .05$.

D. Moderating Effects of Social Support on the Relationship between Stress Due to Alcohol Abuse and Its Negative Consequences

Hypotheses 3a through 3c proposed a moderating effect of social support, such that the negative effect of alcohol abuse-induced stress on life satisfaction, depression, and physical health would be less harmful when social support was high.

Before moderated regression analysis was performed, independent and moderator variable were centered (i.e., centered $x = \text{original } x - \text{mean of } x$). Although it does not change the p levels for the interaction estimate, it does produce standardized coefficient estimates that are less than ± 1.00 .

In the moderated regression analysis, the control variables were entered as one block in the regression. Direct effects of stress due to alcohol abuse and social support on each outcome variable were entered into the regression equation simultaneously on step two to test whether, or to what extent, they would predict the outcome variables of depression, physical health problems, and life satisfaction. Finally, the two way interaction term, alcohol abuse-induced stress \times social support was introduced into the equation at step three to test the moderating effect between alcohol abuse-induced stress and social support on three outcome variables. If the interaction effect was statistically significant, a subgroup analysis was conducted in which the social support scores were categorized into low and high levels of social support.

Additionally, the influential statistics of deleted residual, Cook's D , and standardized Difference in Fit were employed in order to detect and eliminate influential cases and to improve moderated regression diagnostics. After detecting and removing influential cases that were among the 10 highest values on all three diagnostic measures

mentioned above, the model was reanalyzed. Any significant changes in regression analyses after deleting influential cases will be reported.

Since the direct effects of the stress due to alcohol abuse and social support were described previously, only the buffering effect of social support with three outcome variables will be addressed here.

1. Moderating Effect of Social Support on the Relationship of Stress and Life Satisfaction

The results of the moderated regression analysis are shown in Table 8. The interaction of stress due to alcohol abuse with social support was not statistically significant ($\beta = .03$, $p = .63$).

Deleted Residual, Cook's Distance, and Standardized Difference Fit were examined to detect the presence of influential cases and identified six cases had met the criteria for being "high influential". Although deletion of six influential cases, the interaction effect of social support was not found to be significant ($\beta = .07$, $p = .28$).

Table 8. Moderated Regression of Social Support on Life Satisfaction Before and After Influential Case Deletion

Variables	B	β	R ²	R ² INC
Before Influential Case Deletion (N=240)				
Stress due to alcohol abuse \times Social support	.09	.03	.29	.001
After Influential Case Deletion (N=234)				
Stress due to alcohol abuse \times Social support	.19	.07	.32	.002

* $p < .05$ ** $p < .10$

2. Moderating Effect of Social Support on the Relationship of Stress and Depression

Like the findings from the moderated regression analyses of social support on the relationship of AIS to life satisfaction, social support did not moderate the effect of AIS on depression before or after influential case deletion (before deletion; $\beta = .00$, $p = .99$, after deletion; $\beta = .04$, $p = .52$) (Table 9).

Table 9. Moderated Regression of Social Support on Depression Before and After Influential Case Deletion

Variables	B	β	R^2	R^2 INC
Before Influential Case Deletion (N=244)				
			.19	.002
Stress due to alcohol abuse \times Social support	.00	.00		
After Influential Case Deletion (N=237)				
			.23	.003
Stress due to alcohol abuse \times Social support	.09	.04		

* $p < .05$ ** $p < .10$

3. Moderating Effect of Social Support on the Relationship of Stress and Physical Health Problems

Unlike the findings from the moderated regression analyses of social support on the relationship of AIS to depression and life satisfaction, social support did moderate the effect of alcohol abuse-induced stress on physical health problems (before influential case deletion; $\beta = -.17$, $p = .01$, after influential case deletion; $\beta = -.26$, $p = .00$).

As shown in Table 10, the slope coefficient for the interaction of .34 indicates that the slope of physical health problems on stress due to alcohol abuse becomes 0.34 more

positive for a one-unit increase in social support, contrary to a buffering role of social support. Thus, the interaction effect was statistically significant, but it was in the opposite (or reverse buffering) direction.

Table 10. Moderated Regression of Social Support on Physical Health Problems Before and After Influential Case Deletion

Variables	B	β	R ²	R ² INC
Before Influential Case Deletion (N=243)				
			.19	.03
Stress due to alcohol abuse \times Social support	.34	.17*		
After Influential Case Deletion (N=237)				
			.26	.06
Stress due to alcohol abuse \times Social support	.51	.26*		

* $p < .05$

In addition, it is not apparent from the significant product terms in the moderated regression analysis whether the form of the interaction conforms to the buffering expectation. In order to evaluate this significant interaction effect of social support, subgroup analyses were performed for low, medium, and high levels of social support. To present the nature of the buffering effect of social support on physical health problems, the significance level and directions of each regression slopes and beta were checked and compared at the low, medium, and high levels of social support as shown in Table 11. For all three levels of social support, there were significant relationships between stress due to alcohol abuse and physical health problems (Low: $\beta = -.189$, $p < .10$; Medium: $\beta = -.418$, $p < .05$; High: $\beta = -.522$, $p < .05$, respectively).

Table 11. Correlations between Alcohol-Induced Stress and Physical Health Problems across Subgroups

	Low (n = 85)		Medium (n = 94)		High (n = 88)	
Social Support	B	β	B	β	B	β
	.547	.189*	1.284	.418**	1.690	.522**

*p<.10 **p<.05

According to the buffering theory of social support, there should be a smaller correlation when support is high. It should buffer the relationship between stress and physical health problems. It is expected as support increases, the negative impact of stress diminishes.

A common sense interpretation of the counterintuitive moderating effect can be achieved by viewing the significant interaction in an alternative subgrouping analysis in which the stress variable is treated as the moderator variable. An especially clear view arises when stress is trichotomized into low, medium, and high categories, and then review the relationships of social support (as the predictor variable) with the physical health problems. Table 12 shows the correlations for physical health problems.

Table 12. Bivariate Correlations of Social Support with Physical Health Problems for Low, Medium, and High Stress due to Alcohol Abuse

	Level of Stress due to Alcohol Abuse		
	High (n = 91)	Medium (n = 90)	Low (n = 86)
Physical Health Problems	.12	-.11	-.21*

*p<.05

Social support reduces physical health problems when stress is low, but not when it is high and medium. Thus, the obtained moderating effect reflects that stress due to alcohol abuse pose a limiting condition for the benefit of social support: when people perceive low or medium stress, but not high stress, social support is associated with fewer physical health problems.

4. Additional Exploration of Moderating Effects: Moderating Effects of SOSS Sources on Study Variables

As shown in Table 13, the moderated regression analyses were used to test whether, and to what extent, the moderating effect of specific sources of support on three outcome variables. Social support from church members and clergyperson did moderate the effect of AIS on both life satisfaction and physical health problems. The interaction of AIS with support from employer and co-workers were statistically significant on depression and physical health problems. It is notable that any source of social support from family and friends did not moderate the effect of AIS on three outcome variables except children on life satisfaction.

Table 13. Moderating Effects of SOSS on Study Variables

SOSS	Depression			Physical Health Problems			Life Satisfaction		
	ΔR	β	N	ΔR	β	N	ΔR	β	N
Spouse	.003	-.055	198	.004	.064	199	.001	.026	199
Parent	.002	-.048	235	.004	.066	234	.004	.067	236
Children	.002	-.051	136	.010	.103	136	.017	.132*	136
Relatives	.002	-.048	238	.001	.034	237	.000	-.004	239
Friends	.002	.050	239	.002	.040	238	.000	-.023	240
Neighbors	.004	-.065	187	.009	.098	185	.001	.032	187
Employer	.024	-.162**	145	.064	.264**	144	.014	.124	145
Co-Workers	.018	-.139*	145	.040	.206**	144	.009	.100	145
Clergyperson	.000	-.007	138	.022	.277**	138	.019	.141*	139
Church Members	.011	.107	125	.022	.152*	125	.019	.140*	126
Therapist/Case manager	.003	.059	236	.000	.011	235	.005	.068	237
AA sponsor	.032	.184**	163	.000	-.020	162	.000	.020	163
Emotional Support	.002	-.040	252	.020	.144**	251	.003	.054	253
Practical Support	.001	-.027	240	.016	.130**	239	.004	.065	241

*p<.10 **p<.05

5. Structural Equation Model Analysis

Moderating effects of social support on three outcome variables was evaluated with a multisample SEM. To assess the moderating influence of social support, participants were divided into two groups (n=98 for high support, and n=96 for low support), using a median split.

Perceived availability of social support as a moderator was analyzed using the EQS 6.1 multisample technique, where the levels of the moderator are treated as different groups (i.e., low vs high) and the equivalence of the structural relations between stress due to alcohol abuse and three outcome variables (depression, physical health problems, and life satisfaction) was compared between low and high social support groups.

As shown in Table 14, both initial low and high support groups were estimated separately and indicative of a poor fit (RMSEA were .130 and .079, respectively). Thus, some modification was needed to improve the model's fit. The goodness-of-fit results of the modified model indicated substantial improvement in the overall fit.

Table14. Fit Indexes for the Low and High Support Groups

Model	χ^2	df	CFI	RMSEA
Low social support group				
M1	254.030	102	.910	.130
M2 (cov(d2,d3))	225.619	101	.926	.118
M3 (F4,F3)	193.695	100	.944	.103
M4 (cov(E169,E168))	174.946	99	.955	.093
M5 (cov(E178,E177);(E179,E174))	162.613	97	.961	.088
High social support group				
M1	156.400	101	.962	.079
M2 (cov(d2,d3))	145.414	100	.969	.071
M3 (cov(E178,E177))	134.994	99	.975	.064
M4 (cov(E179,E174))	126.484	98	.981	.057
M5 (cov(E169,E168))	124.408	97	.981	.056

Note. d2 = depression; d3 = physical health problems; F3 = physical health problems; F4 = life satisfaction; E168 = physical subscale of the stress due to alcohol abuse; E169 = interpersonal subscale of the stress due to alcohol abuse; E174 = depression; E177 = self-care subscale of the physical health problems; E178 = getting along with other subscale of the physical health problems; E179 = life activities subscale of the physical health problems.

The hypothesized linear equation models fit the data moderately for the low social support (Model 5: $\chi^2(97) = 162.613$, $p < .01$, CFI = .96, RMSEA = .088) and high social support groups (Model 5: $\chi^2(97) = 124.408$, $p < .01$, CFI = .98, RMSEA = .056). The Comparative Fit Index (CFI) provides a measure of explained covariance in the data for each model and the present CFI values exceed .95, indicating that the hypothesized models adequately represent the latent constructs of social support and three outcome variables.

The unstandardized and standardized factor loadings for low and high support groups are shown in Table 15. As shown in Table 15, the loadings on latent factors were different across groups.

Table 15. Unstandardized and Standardized Loading on Latent Factors by Group

IVs	DVs	Low Support		High Support	
		B	β	B	β
Stress	Physical	1.00	.88	1.00	.90
	Interpersonal	1.77*	.98	1.42*	.95
	Intrapersonal	1.47*	.89	1.09*	.89
	Impulse control	1.26*	.81	1.02*	.73
	Social responsibility	1.06*	.85	.78*	.80
Depression	Depression	1.00	.96	1.00	.95
Physical health problems	Understanding & communicating	1.00	.82	1.00	.65
	Getting around	.76*	.56	1.21*	.67
	Self-care	.86*	.70	1.02*	.69
	Getting along with others	.93*	.74	1.23*	.72
	Life activities	1.21*	.71	1.69*	.79
Life satisfaction	Participation in society	1.22*	.84	1.31*	.82
	Health & functioning	1.00	.98	1.00	.95
	Socio-economic	.69*	.75	.64*	.67
	Psychological/spiritual	.84*	.76	.88*	.72
	Family	.63*	.56	.56*	.48
Stress	Depression	.06*	.42	.06*	.52
	Physical health problems	.05*	.36	.06*	.62
Physical health problems	Life satisfaction	-.07*	-.28	-.06*	-.31
	Life satisfaction	-.96*	-.57	-.94*	-.47

*p<.05

As shown in Table 16, the baseline model is the combination of low group model and high group model without equality constraints. The χ^2 and the df of baseline model were the summation of the χ^2 values and the df of low support group and high support group.

Table 16. Summary Results of Measurement Model Development

Group	χ^2	df	CFI	RMSEA	$\Delta \chi^2(df)$
Low support group	162.613	97	.961	.088	
High support group	124.408	97	.981	.056	
Baseline model (M1)	287.020	194	.970	.052	
Measurement model (M2)	300.866	206	.970	.051	
M2 – M1					13.85(12)
Structural model (M3)	304.566	210	.970	.050	
M3 – M1					17.55(16)

The measurement model was obtained by adding constraints that set twelve parameters equal across the two groups. The parameters of a given model are hypothesized to be equal across the groups, and the LM test was used to improve model fit. Each group was constrained to equality across groups in baseline model. The baseline model was a fully unconstrained model (i.e., there were no constraints placed in the model to test for differences between the low and high social support groups). The constrained model hypothesized that all paths were equal in the low and high support groups (e.g., that there were no differences in paths between the high and low support subgroups, which is not what was hypothesized).

For each latent variable in the model, one factor loading was fixed to 1.00 and then unconstrained models were estimated in which the other factor loadings as well as the hypothesized paths and covariances between latent factors were estimated freely for each group. This comparison tests invariance across groups for the relationships among constructs as hypothesized. The Likelihood ratio test was used to test the appropriateness of the constraints by comparing the difference of χ^2 values between the two models (Table 16). The χ^2 difference between measurement model and baseline model was 13.85

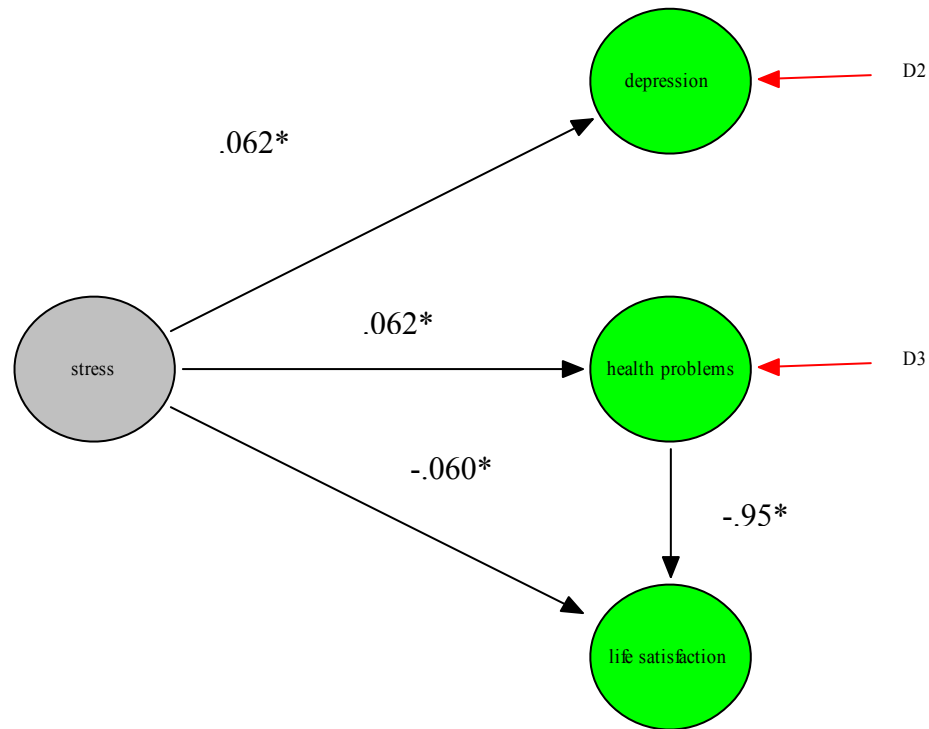
with 12 df, twelve parameters were not significantly different across the two groups. In other words, $\Delta \chi^2$ should not be significant if the model is invariant between low and high support group. $\Delta \chi^2$ test revealed that the model had measurement invariance across groups (that is, the model applies across groups).

The structural model was obtained by constraining all factor regression coefficients (F1, stress due to alcohol abuse; F2, depression; F3, physical health problems; F4, life satisfaction) to be equal across the two groups. With χ^2 difference between structural model and measurement model is 17.55 with 16 df, the hypothesis that overall 16 covariances among measurement errors and between the exogenous factors were equal was not rejected.

Since baseline and constrained models were not significantly different, it was obtained that the structural paths were equal across groups. Thus, it is concluded that the structural model is invariant and therefore there is no different between the groups (i.e., no moderation).

Figure 1 presents the structural model for results of the causal model estimation. Standardized regression coefficients for each path are indicated for both levels of social support.

Figure1. Results of the Causal Model Estimation



* $p < .05$

The difference in χ^2 between structural model and baseline model was evaluated to test buffering effects of social support between stress due to alcohol abuse and three outcome variables. The χ^2 were 304.566, with 210 degree of freedom, for the structural model where all parameters were equivalent across groups and 287.020, with 194 degrees of freedom, for the baseline model. $\Delta \chi^2$ test revealed that no existence of a significant moderating influence that was attributable to social support.

V. DISCUSSION

While reviewing the literature for this study, it became apparent that there was little known about the complex phenomenon of the stress buffering role of social support in alcoholics, and that no formal quantitative studies have been reported which examine the impacts of specific sources of support on individual health and well-being of alcoholics. Thus, the primary purpose of this study was to investigate the impact of alcohol-induced stress and social support on the three outcome variables that are relevant to an individual's health and well-being and the contribution of perceived social support in the relationship between stress due to alcohol abuse and its negative consequences among alcoholics. The study hypothesized that (1) higher levels of perceived alcohol-induced stress would associate with lower life satisfaction, higher depressive symptoms, and higher physical health problems, (2) social support would positively associate with life satisfaction, and negatively associate with depressive symptoms and physical health problems, and (3) the effect of alcohol-induced stress on life satisfaction, depressive symptoms, and physical health problems would be reduced when social support were high.

In this chapter, discussion of the findings will be provided within the study purposes. In addition, limitations of the study will be addressed, as well as implications for future study.

A. Discussion of Significant Findings

1. Main effects of stress due to alcohol abuse and perceived social support on three outcome variables

The idea that stress affects health and well-being is widely accepted by the public and among many researchers (Turner & Lloyd, 2004). Severe alcohol use provides discrete stressor (stressful life events) and, perhaps, “strains,” and is expected to relate to a set of negative outcomes that is relevant to an individual’s health and well-being. The existing literature on the behavioral consequences of alcohol use and depression, physical health, and life satisfaction is consistent with this (Glenn, Parsons, & Steven, 1989; Hingson, Mangione, Meyers, & Scotch, 1982; Jordon & Oei, 1989; Madianos, Gefou-Madianou, & Stefanis, 1994; Okundaye, Smith, & Lawrence-Webb, 2001).

In the present study, severity of alcohol consequences is to be regarded as stress, and this study hypothesized that higher levels of perceived alcohol-induced stress would associate with lower life satisfaction, higher depressive symptoms, and higher physical health problems. The expectation that stress due to alcohol abuse would have a direct association with three outcome variables was clearly supported by the results of this study. Stress due to alcohol abuse had direct effects on three outcome variables, indicating that high levels of perceived stress due to alcohol abuse contributed to lower life satisfaction, higher depressive symptoms, and higher physical health problems in alcoholics. This finding suggests that high degrees of stress due to alcohol abuse are some of the risk factors influencing alcoholics’ health and well-being.

According to Gottlieb (1985), personal and social resources can have a direct effect on acting to reduce exposure to stressful events and enhance the health of the

individual. Additionally, social support has been acknowledged as one potential protective factor against the development of substance use problems. The first model tested in this study was the main effects of social support on the negative outcomes of alcohol-induced stress that are relevant to an individual's health and well-being. The main-effect model holds that an increase in social support will result in an increase in well-being irrespective of the existing level of stress. In the present sample, it was found that social support had a direct effect on individuals' health and well-being for two of the three outcomes studied. A direct effect of social support on depressive symptoms was not supported in the present study but the direction of the relationship was as had been hypothesized.

The prevalence (71.2%) of depressive symptoms on CES-D in this study was much higher than those in the general population. This result was in accordance with previous research reporting a higher prevalence of depression in alcoholics than those in the general population (Bobo, McIlvain, and Leed-Kelly, 1998; Harmen & Sanderson, 1999). Interpersonal difficulties may be attributed to less supportive relationships within the alcoholic family and the subsequent decrease in close social relationships. This may, in turn, affect an individual's ability to develop and maintain satisfying intimate relationships in other informal or formal relationships (Domenico & Windle, 1993). Perhaps, social support was not generally and substantially important because of the likelihood that the support system has been devastated by the clients' illness in this sample. It may not be surprising that informal support is not helpful for depression in this sample, since they are at clinical levels where professional care is needed. Thus, perceived social support may not be a significant factor for alcoholic clients whose

support system may have become shaken and unstable by the consequences of the respondents' pathology.

Additionally, stress explained more outcome variance than social support, with the direct effect of support only approaching significance in multivariate tests when an overall (across sources) measure of support was used.

One goal of this study was to explore the roles of specific sources of social support, and it was found that some specific sources of support were efficacious. It is interesting that spouse, relatives, and friends support is actually significantly beneficial for physical health problems and possibly life satisfaction, since these sources might be regarded as contributors or enablers. For example, support from spouse, relatives, and friends were important to clients' lower physical health problems in the present study. Current study data revealed that life satisfaction was also related significantly to support from spouse, relatives, and friends. Friends, especially, might be seen as contributing to a drinking problem, but the data reveal a positive effect. It may be the case that the SOSS, though designated to tap available support, reflects receipt of support in these cases (Koeske, 2004). That is, respondents may be especially likely to have received support from sympathetic friends. Thus, in view of its direct effect, the enhancement of social support is highly recommended into the treatment for alcoholics.

2. Moderating effects of social support in the relationship between stress due to alcohol abuse and its negative consequences

Coping resources may have either direct positive effects on health or may indirectly enhance health by facilitating effective coping behavior (Heaney, Price, &

Rafferty, 1995). The substance abusers' use of coping resources to manage a stressful life may reduce the negative impact of secondary stress on their well-being, whereas their lack of coping resources may increase the negative impact of secondary stress. Lazarus and Folkman posits that social support has beneficial effects because the availability of supportive functions from other persons helps an individual to deal better with problems (Wills & Cleary, 1996). Coping resources can moderate the negative effects of stress and help an individual reduce the impact of stressors. Stress-coping theory provides the theoretical underpinning for the buffering model, which suggests that high levels of social support protect the individual against the deleterious impact of stress on health (Stroebe et al., 1996). In the context of problem drinking and drug misuse, it is suggested that emotional or practical support may help substance abusers to cope with problems from school, home, or work domains and may help them deal with emotional states such as anxiety, depression, or anger (Smith, Laframboise, & Bittinger, 2002).

A purpose of this study was to examine the importance of perceived availability of social support as it applies to the negative outcomes of alcohol-induced stress that are relevant to an individual's health and well-being. While the results of the study on direct effects of alcohol-induced stress and social support were generally supported with exception of the direct effect of social support on depression, the buffering hypotheses were not. Especially, the relationship of stress due to alcohol abuse with physical health problems should be larger for the low support alcoholics, since social support was presumed buffer. However, it was non-significantly larger for the high support clients. This opposite direction ("reverse buffering") of difference from what is expected by the

buffering hypothesis has occasionally been found by other researchers (Beehr, 1985; Jenkins & Elliott, 2004; Kaufmann & Beehr, 1989; Patterson, 2003; Sales et al., 2004).

In fact, for the stress and physical health problems relationship a “reverse buffering effect” was suggested, i.e., a larger destructive effect of stress occurred when support was high rather than low. If we recast support as the primary independent variable, greater social support was related to lower physical health problems only when stress was at a low level, but not when stress was more severe. The form of this interaction demonstrated not “support buffering” for which perceived social support ameliorates the negative impact of stress due to alcohol abuse on physical health problems, but “support limits,” in which high stress may cancel the normally beneficial influence of perceived social support (Rauktis & Koeske, 1994). The pattern found in this study suggests that social support may have more limited ability to forestall negative consequences of a stressor, when the stressors are more severe. In other words, the reverse buffering effect indicates support that benefits dissolve when stress is too high. Understanding interaction effects of stress with social support sources on the three outcome variables that are relevant to an individual’s health and well-being is a complicated issue. In the present study, support from employer and co-workers were most apparent in terms of reverse buffering effect relating to both physical health problems and life satisfaction. Co-workers may have been seen as a risk factor in maintaining abstinence, such that high co-worker support worsens the effect of stress on outcomes. Employer support, following the reasoning suggested above, may be beneficial only when stress levels are low. Beyond that, the employer may become ineffectual or might view the worker as recalcitrant or incorrigible. Of course, we might also imagine that the

co-worker, similarly, is actually a positive influence until stress is too high and informal non-professional support is inefficacious.

In the present study, two different statistical methods were used to test the moderating effects of social support on the three dependent variables, and an interesting statistical issue arose, since the methods did not reveal fully consistent findings regarding support buffering.

Structural equation modeling (SEM) using a multisample analysis was considered to obtain more reliable moderating effects via exclusion of measurement errors in estimating interaction effects. Unreliability of measurement produces bias in the estimation of regression coefficients, and such measurement error is particularly problematic in interaction analysis. Structural equation modeling can do a satisfactory job of interaction analysis in the presence of measurement error. The difference in the χ^2 s between the structural model and the baseline model was evaluated to test buffering effects of social support between stress due to alcohol abuse and three outcome variables. The results indicated that level of social support did not moderate the association between stress due to alcohol abuse and three outcome variables. Thus, the inability to detect a buffering effect in the moderated regression analysis was presumably not attributable to measurement error. In other words, the SEM approach did not detect the reverse buffering interaction obtained in some of the moderated regression.

To gauge a possible reason for this inconsistency, standard moderated multiple regressions were performed using EQS which adjust for heteroscedasticity, an apparent violation of regression assumption accruing in the analysis for the interaction of stress with support on physical health problems. When tested using the EQS adjustment, the

reverse buffering interaction that was significant in the original moderated regression analysis was not significant ($df = 189$, $t = 1.372$, $p = .172$). In the presence of heteroscedasticity, the usual tests of significance are generally inappropriate and their use can lead to incorrect inferences (Long & Ervin, 2000).

Violation of homoscedasticity makes it difficult to gauge the true standard deviation of the forecast errors. According to Berry and Feldman (1985) and Tabachnick and Fidell (1996), heteroscedasticity can lead to serious distortion of findings and seriously weaken the analysis thus increasing the possibility of a Type I error. Therefore, inconsistent result between MRA and SEM is possibly due to violation of assumption of homoscedasticity. This apparent finding of reverse buffering, at least for the test using overall support, may be spurious or of smaller magnitude than initially suggested.

B. Limitations of Study

This study has a number of limitations. First, it is important to emphasize that alcohol-induced stress is measured according to the Inventory of Drug Use Consequences (InDUC) which is intended to measure negative consequences of alcohol and drug use. Thus, the InDUC is a proxy for alcohol induced stress which was not directly measured in these available data. It was assumed that through reporting more negative consequences of alcohol use were experiencing greater stress as a function of those experiences. Stress and strain were not directly reported in the database. Future research would benefit from development of a separate measure of stress events and strain arising from drinking behavior. In addition, an independent measure of alcohol pathology

severity existing prior to the reported behavior consequences would be needed to control for pre-existing alcohol severity. In the current study, it was difficult to distinguish effects of alcohol induced (secondary) stress from the primary alcoholism pathology, since only the presence of previous treatments was available as a proxy for primary pathology. The measured identified outcomes may actually be antecedent to some measured consequences of alcohol use though this does not seem as intuitively plausible as the stress → outcome direction imposed in the study. Support is a greater problem with respect to the cause and effect determinism. Physical health problems and depression may be conditions that undermine or impact on social support perceived availability.

Second, a longitudinal study would allow assessment of how social support varies over time with this population. Additionally, it should be emphasized that due to the non-experimental design of this research investigation, findings should not be construed as indicating causal relationships. Rather, significant relationships between study variables should be interpreted as suggesting an important relationship.

Third, since ninety percent of participants were White, generalizability of findings beyond majority White clients are dubious. Therefore, the question of how widely applicable the findings are to other ethnic populations remains a subject for future research. Also, it is a regional sample, mostly voluntary and with greater resources than some alcoholics. To increase generalizability, recruiting alcoholics from broad geographic areas with random selection is needed.

C. Implications

Despite its limitations, the present study provides several implications for helping professions working with alcohol abusing clients. Supportive interpersonal relationships are an important component of an individual's social-environmental resources. The presence of social support resources may supply the resources necessary for effective coping. Therefore, this study investigated social support resources as a protective factor among alcoholics.

Results from this study suggest that social support has beneficial direct effects on both alcoholics' life satisfaction and physical health problems. Thus, professions working with alcoholics may need to assess and encourage the development and use of available support networks, in order to protect physical health and enhance life satisfaction of alcoholics.

Although this study provides evidence that social support may affect an alcoholic's life satisfaction and physical health problems, the findings also argue for its differential impact. Professions working with alcoholics need to recognize that social support is less helpful when clients' alcohol abuse-induced stress is more severe.

The results of this study revealed that social support did not buffer the influence of alcohol abuse-induced stress on three outcome variables. However, the present study may have at least three distinct contributions. First, the finding that the greater the severity and consequences of drinking, the greater impact on depression, physical health problems, and life satisfaction is notable and consistent with existing literature. Even in this very troubled clinical group, the impact was significant and moderate in size. A second contribution was identification of some particular sources of support that provide

direct benefits, especially for physical health. So, even for these, people who may have damaged social networks, they may access their social network, especially spouse, friends, and relatives, and incur somewhat less negative life outcomes. This might be remarkable given that this disease very likely involves possible devastation of one's immediate social network due to the denial, deception, and violation of trust that is involved. So, the practitioner may have something to build on here, while still realizing, given possible reverse buffering, that it may not be enough. A third contribution involved showing that even in this important group the clients reported a sense of available support that was not far below what has been found in non-clinical samples (Koeske & Koeske, 2002). That is, despite the devastation that might expected due to the disease process, respondent still anticipate they have support.

Additionally, the findings of this study remind helping professions working with alcoholics that some sources of support were directly efficacious. By identifying perceived social support as a predictor of individual health and well-being among alcoholics, an avenue for intervention become possible, because coping resource building is something that everybody has some control over. Specifically, we now know what support resources are most highly correlated to their health and well-being. Clinically speaking, the findings of this study can be incorporated into the treatment design and could be an important component of treatment planning for alcoholics. Cognitive interventions could be employed to increase individuals' awareness of the social support in their life. For example, clients could be encouraged to form an aftercare support group, and to engage with significant others and friends who provide mutual relationships. Reframing could be used to help individuals reassess their perception of the support in

their environment. Furthermore, grassroots organization and the use of community interventions aimed at building a sense of community might positively influence the affects of the stressors for individuals, families and communities. It is essential that intervention studies are done in order to evaluate the most effective ways of promoting supportive relationship in reducing the impact of stress due to alcohol abuse on individual health and well-being of alcoholics. With regard to the effects of general vs. alcohol specific social support, future studies can be more comprehensively examined in both general and alcohol specific social support. The findings on the effects of general vs. specific social support will indicate either general or specific social support play a more important role in the abstinence of alcoholics.

High degrees of stress due to alcohol abuse and lack of social support are some of the risk factors influencing alcoholics' health and well-being. The results of this study also show that increasing stress caused by severe alcohol use may be expected to relate to a set of negative outcomes in alcoholics. From a policy perspective, the present study advocates a differentiated or group-specific approach to the intervention of complex relationships between secondary stress of alcohol abuse and its negative consequences that are relevant to an individual's health and well-being.

Substance abuse has become an important area of public policy not only because of appropriations for treatment programs but also because of the enormous costs that substance abuse extracts from society (Karger & Stoesz, 1998). Efforts to prevent substance abuse problems will lead to savings in other health care costs, in fewer hours lost on the job, and in fewer injuries and deaths due to automobile and other accidents (Moskowitz, 1989; SAMHSA, 1999; Smyth, 1998). The emphasis of U. S. drug policy is

on reducing the harm to society from drug abuse: lost human capital, workplace accidents, spousal and child abuse, family dissolution, increased medical costs and drug-propelled crime (Conner, 1993; Department of Health and Human Services, 1997; Institute for Health Policy, 2001; Klingermann, 2001).

Policy makers continue to make choices among several options on how best to respond to the drug problem. There are many potential solutions ranging from doing nothing to participating in long-term residential treatment programs. Many people resolve alcohol and drug problems through informal interventions (e.g. mutual-support groups like Alcoholic Anonymous) and/or formal intervention (e.g. self-referred or mandated involvement in outpatient, inpatient, or residential treatment programs) (Sobell, Sobell, Toneatto, & Leo, 1993; Wilke, 2000). The results of this study can be applied to intervention system for alcoholics to improve the quality of care without necessarily increasing the cost.

According to Lynn (2002), social service delivery has historically been motivated by what Tocqueville termed “the principle of association” – that is, it has been largely spontaneous, voluntary, informal, private, and oriented toward the destitute and dependent needy. One approach that seeks to address the substance issue, treatment programs have long sought to bolster clients’ social support. In practice, efforts to increase social support are informal or non-systematic and occur in the context of overall case management (Litt & Mallon, 2003). Social support, in the form of perceived availability of substance-using clients, will be a direct contributor to problems related to drug and alcohol use.

APPENDICES

APPENDIX A

MEASUREMENT OF ALCOHOL-INDUCED STRESS

Here are a number of events that people drink or use drugs sometimes experience. Read each one carefully, and circle the number that indicates whether this has ever happened to you (0 = No, 1 = Yes). Then also indicate how often each one has happened to you DURING THE PAST 3 MONTHS by circling the appropriate number (0 = Never, 1 = Once or a few times, etc.). If an item does not apply to you, circle zero (0).

	Has this EVER happened to you?		DURING THE PAST 3 MONTHS, about how often has this happened to you?			
	No	Yes	Never	Once or a few times	Once or twice a week	Daily or almost daily
1. I have had a hangover or felt bad after drinking or using drugs.	0	1	0	1	2	3
2. I have felt bad about myself because of my drinking or drug use.	0	1	0	1	2	3
3. I have missed days of work or school because of my drinking or drug use.	0	1	0	1	2	3
4. My family or friends have worried or complained about my drinking or drug use.	0	1	0	1	2	3
5. I have enjoyed drinking or using drugs.	0	1	0	1	2	3
6. The quality of my work has suffered because of my drinking or drug use.	0	1	0	1	2	3
7. My ability to be a good parent has been harmed by my drinking or drug use.	0	1	0	1	2	3
8. After drinking or using drugs, I have had trouble with sleeping, staying asleep, or nightmares.	0	1	0	1	2	3

	Has this EVER happened to you?		DURING THE PAST 3 MONTHS, about how often has this happened to you?			
	No	Yes	Never	Once or a few times	Once or twice a week	Daily or almost daily
9. I have driven a motor vehicle while under the influence of alcohol or other drugs.	0	1	0	1	2	3
10. Drinking or using one drug has caused me to use other drugs more.	0	1	0	1	2	3
11. I have been sick and vomited after drinking or using drugs.	0	1	0	1	2	3
12. I have been unhappy because of my drinking or drug use.	0	1	0	1	2	3
13. Because of my drinking or drug use, I have lost weight or not eaten properly.	0	1	0	1	2	3
14. I have failed to do what is expected of me because of my drinking or drug use.	0	1	0	1	2	3
15. Drinking or using drugs has helped me to relax.	0	1	0	1	2	3
16. I have felt guilty or ashamed because of my drinking or drug use.	0	1	0	1	2	3
17. While drinking or using drugs I have said or done embarrassing things.	0	1	0	1	2	3
18. When drinking or using drugs my personality has changed for the worse	0	1	0	1	2	3

	Has this EVER happened to you?		DURING THE PAST 3 MONTHS, about how often has this happened to you?			
	No	Yes	Never	Once or a few times	Once or twice a week	Daily or almost daily
19. I have taken foolish risks when I have been drinking or using drugs.	0	1	0	1	2	3
20. I have gotten into trouble because of drinking or drug use	0	1	0	1	2	3
21. While drinking or using drugs, I have said harsh or cruel things to someone.	0	1	0	1	2	3
22. When drinking or using drugs, I have done impulsive things that I regretted later.	0	1	0	1	2	3
23. I have gotten into a physical fight while drinking or using drugs.	0	1	0	1	2	3
24. My physical health has been harmed by my drinking or drug uses.	0	1	0	1	2	3
25. Drinking or using drugs has helped me to have a more positive outlook on life.	0	1	0	1	2	3
26. I have had money problems because of my drinking or drug use	0	1	0	1	2	3
27. My marriage or love relationship has been harmed by my drinking or drug use.	0	1	0	1	2	3
28. I have smoked tobacco more when I am drinking or using drugs.	0	1	0	1	2	3

	Has this EVER happened to you?		DURING THE PAST 3 MONTHS, about how often has this happened to you?			
	No	Yes	Never	Once or a few times	Once or twice a week	Daily or almost daily
29. My physical appearance has been harmed by my drinking or drug use	0	1	0	1	2	3
30. My family has been hurt by my drinking or drug use.	0	1	0	1	2	3
31. A friendship or close relationship has been damaged by my drinking or drug use.	0	1	0	1	2	3
32. I have spent time in jail or prison because of my drinking or drug use.	0	1	0	1	2	3
33. My sex life has suffered because of my drinking or drug use.	0	1	0	1	2	3
34. I have lost interest in activities and hobbies because of my drinking or drug use	0	1	0	1	2	3
35. When drinking or using drugs, my social life has been more enjoyable.	0	1	0	1	2	3
36. My spiritual or moral life has been harmed by my drinking or drug use.	0	1	0	1	2	3
37. Because of my drinking or drug use, I have not had the kind of life that I want.	0	1	0	1	2	3
38. My drinking or drug use has gotten in the way of my growth as a person.	0	1	0	1	2	3
39. My drinking or drug use has damaged my social life, popularity, or reputation.	0	1	0	1	2	3

	Has this EVER happened to you?		DURING THE PAST 3 MONTHS, about how often has this happened to you?			
	No	Yes	Never	Once or a few times	Once or twice a week	Daily or almost daily
40. I have spent too much or lost a lot of money because of my drinking or drug use.	0	1	0	1	2	3
41. I have been arrested for driving under the influence of alcohol or other drugs.	0	1	0	1	2	3
42. I have been arrested for other offenses (besides driving under the influence) related to my drinking or other drug use.	0	1	0	1	2	3
43. I have lost a marriage or a close love relationship because of my drinking or drug use.	0	1	0	1	2	3
44. I have been suspended/fired from or left a job or school because of my drinking or drug use.	0	1	0	1	2	3
45. I have used drugs moderately, without having problems.	0	1	0	1	2	3
46. I have lost a friend because of my drinking or drug use.	0	1	0	1	2	3
47. I have had an accident while using or under the influence of alcohol or drugs.	0	1	0	1	2	3
48. While using or under the influence of alcohol or drugs, I have been physically hurt, injured, or burned	0	1	0	1	2	3

	Has this EVER happened to you?		DURING THE PAST 3 MONTHS, about how often has this happened to you?			
	No	Yes	Never	Once or a few times	Once or twice a week	Daily or almost daily
49. While using or under the influence of alcohol or drugs, I have injured someone.	0	1	0	1	2	3
50. I have broken things or damaged property while using or under the influence of alcohol or drugs.	0	1	0	1	2	3

APPENDIX B

MEASUREMENT OF DEPRESSIVE SYMPTOMS

INSTRUCTIONS: For each statement, please circle the number in the column that best describes how you have been feeling *in the past week*.

	Rarely or none of the time (less than 1 day)	Some or a little of the time (1-2days)	Occasionally or a moderate amount of the time (3-4 days)	Most or all of the time (5-7 days)
1. I was bothered by things that usually don't bother me.	0	1	2	3
2. I did not feel like eating; my appetite was poor.	0	1	2	3
3. I felt that I could not shake off the blues, even with the help from family or friends.	0	1	2	3
4. I felt that I was just as good as other people.	0	1	2	3
5. I had trouble keeping my mind on what I was doing.	0	1	2	3
6. I felt depressed.	0	1	2	3
7. I felt that everything I did was an effort.	0	1	2	3
8. I felt hopeful about the future.	0	1	2	3
9. I thought my life had been a failure.	0	1	2	3
10. I felt fearful.	0	1	2	3
11. My sleep was restless.	0	1	2	3
12. I was happy.	0	1	2	3
13. I talked less than usual.	0	1	2	3
14. I felt lonely.	0	1	2	3
15. People were unfriendly.	0	1	2	3
16. I enjoyed life.	0	1	2	3
17. I had crying spells.	0	1	2	3
18. I felt sad.	0	1	2	3
19. I felt that people dislike me.	0	1	2	3
20. I could not get "going".	0	1	2	3

APPENDIX C

MEASUREMENT OF LIFE SATISFACTION

For each of the following, please choose the answer that best describes how *satisfied* you are with that area of your life. Please mark your answer by circling the number. There are no right or wrong answers.

HOW <i>SATISFIED</i> ARE YOU WITH:	Very Dissatisfied	Moderately Dissatisfied	Slightly Dissatisfied	Slightly Satisfied	Moderately Satisfied	Very Satisfied
1. Your health?	1	2	3	4	5	6
2. Your health care?	1	2	3	4	5	6
3. The amount of pain that you have?	1	2	3	4	5	6
4. The amount of energy you have for everyday activities?	1	2	3	4	5	6
5. Your ability to take care of yourself without help?	1	2	3	4	5	6
6. The amount of control you have over your life?	1	2	3	4	5	6
7. Your chances of living as long as you would like?	1	2	3	4	5	6
8. Your family's health?	1	2	3	4	5	6
9. Your children?	1	2	3	4	5	6
10. Your family's happiness?	1	2	3	4	5	6
11. Your sex life?	1	2	3	4	5	6
12. Your spouse, lover, or partner?	1	2	3	4	5	6
13. Your friends?	1	2	3	4	5	6
14. The emotional support you get from your family?	1	2	3	4	5	6
15. The emotional support you get from people other than your family?	1	2	3	4	5	6
16. Your ability to take care of family responsibilities?	1	2	3	4	5	6

HOW <i>SATISFIED</i> ARE YOU WITH:	Very Dissatisfied	Moderately Dissatisfied	Slightly Dissatisfied	Slightly Satisfied	Moderately Satisfied	Very Satisfied
17. How useful you are to others?	1	2	3	4	5	6
18. The amount of worries in your life?	1	2	3	4	5	6
19. Your neighborhood?	1	2	3	4	5	6
20. Your home, apartment, or place where you live?	1	2	3	4	5	6
21. Your job (if employed)?	1	2	3	4	5	6
22. Not having a job (if unemployed, retired, or disabled)?	1	2	3	4	5	6
23. Your education?	1	2	3	4	5	6
24. How well you can take care of your financial needs?	1	2	3	4	5	6
25. The things you do for fun?	1	2	3	4	5	6
26. Your chances for a happy future?	1	2	3	4	5	6
27. Your peace of mind?	1	2	3	4	5	6
28. Your faith in God?	1	2	3	4	5	6
29. Your achievement of personal goals	1	2	3	4	5	6
30. Your happiness in general?	1	2	3	4	5	6
31. Your life in general?	1	2	3	4	5	6
32. Your personal appearance?	1	2	3	4	5	6
33. Yourself in general?	1	2	3	4	5	6

APPENDIX D

MEASUREMENT OF PHYSICAL HEALTH PROBLEMS

This questionnaire asks about difficulties due to health conditions. Health conditions include diseases or illnesses, other health problems that may be short or long lasting, injuries, mental or emotional problems, and problems with alcohol or drugs.

Think back over the last 30 days and answer these questions thinking about how much difficulty you had doing the following activities. For each question, please circle only one response.

In the last 30 days, how much difficulty did you have in:					
<u>Understanding and communicating</u>	None	Mild	Moderate	Severe	Extreme/ Cannot Do
D1.1 Concentrating on doing something for ten minutes?	1	2	3	4	5
D1.2 Remembering to do important things?	1	2	3	4	5
D1.3 Analyzing and finding solutions to problems in day to day life?	1	2	3	4	5
D1.4 Learning a new task, for example, learning how to get to a new place?	1	2	3	4	5
D1.5 Generally understanding what people say?	1	2	3	4	5
D1.6 Starting and maintaining a conversation?	1	2	3	4	5
<u>Getting around</u>	None	Mild	Moderate	Severe	Extreme/ Cannot Do
D2.1 Standing for long periods such as 30 minutes?	1	2	3	4	5
D2.2 Standing up from sitting down?	1	2	3	4	5
D2.3 Moving around inside your home?	1	2	3	4	5
D2.4 Getting out of your home?	1	2	3	4	5
D2.5 Walking a long distance such as a kilometre (or equivalent)?	1	2	3	4	5

<u>Self Care</u>	None	Mild	Moderate	Severe	Extreme/ Cannot Do
D3.1 Washing your whole body?	1	2	3	4	5
D3.2 Getting dressed?	1	2	3	4	5
D3.3 Eating?	1	2	3	4	5
D3.4 Staying by yourself for a few days	1	2	3	4	5
<u>Getting along with people</u>	None	Mild	Moderate	Severe	Extreme/ Cannot Do
D4.1 Dealing with people you do not know?	1	2	3	4	5
D4.2 Maintaining a friendship?	1	2	3	4	5
D4.3 Getting along with people who are close to you?	1	2	3	4	5
D4.4 Making new friends?	1	2	3	4	5
D4.5 Sexual activities?	1	2	3	4	5
<u>Life activities</u>	None	Mild	Moderate	Severe	Extreme/ Cannot Do
D5.1 Taking care of your household responsibilities?	1	2	3	4	5
D5.2 Doing most important household tasks well?	1	2	3	4	5
D5.3 Getting all the household work done that you needed to do?	1	2	3	4	5
D5.4 Getting your household work done as quickly as needed?	1	2	3	4	5
<u>Participation in Society</u>	None	Mild	Moderate	Severe	Extreme/ Cannot Do
D6.1 How much of a problem did you have in joining in community activities (for example, festivities, religious or other activities) in the same way as anyone else can	1	2	3	4	5
D6.2 How much of a problem did you have because of barriers or hindrances in the world around you?	1	2	3	4	5

<u>Participation in Society</u>	None	Mild	Moderate	Severe	Extreme/ Cannot Do
D6.3 How much of a problem did you have living with dignity because of the attitudes and actions of others	1	2	3	4	5
D6.4 How much time did you spend on your health condition, or its consequences	1	2	3	4	5
D6.5 How much have you been emotionally affected by your health condition	1	2	3	4	5
D6.6 How much has your health been a drain on the financial resources of you or your family	1	2	3	4	5
D6.7 How much of a problem did your family have because of your health problems	1	2	3	4	5
D6.8 How much of a problem did you have in doing things by yourself for relaxation or pleasure	1	2	3	4	5

APPENDIX E

MEASUREMENT OF SOCIAL SUPPORT

Instructions: For each of the categories of persons listed below, rate the amount of support that is available to you from 1 (None At All) to 5 (A Great Deal). Please rate the amount of support in both Columns A and B. Under A, rate the amount of available EMOTIONAL SUPPORT (such as acceptance of you, advice for how to stay sober, freedom to talk openly about your problems, ability to confide in); under B, rate the amount of available PRACTICAL SUPPORT (such as help with finances, transportation to meetings, baby-sitting, technical information, access to unfamiliar resources that can help in your recovery). In other words, make two ratings for each category of person. For each circle one number between 1 and 5, or NA if the rating is not applicable for you. Refer to this scale.

	None At All 1						A Little 2						A Fair Amount 3						Quite A Bit 4						A Great Deal 5					
Person(s)	A												B																	
	EMOTIONAL SUPPORT												PRACTICAL SUPPORT																	
Spouse/Partner Lifemate	1	2	3	4	5	NA	1	2	3	4	5	NA	1	2	3	4	5	NA												
Parents	1	2	3	4	5	NA	1	2	3	4	5	NA	1	2	3	4	5	NA												
Children	1	2	3	4	5	NA	1	2	3	4	5	NA	1	2	3	4	5	NA												
Relatives	1	2	3	4	5	NA	1	2	3	4	5	NA	1	2	3	4	5	NA												
Friends	1	2	3	4	5	NA	1	2	3	4	5	NA	1	2	3	4	5	NA												
Neighbors	1	2	3	4	5	NA	1	2	3	4	5	NA	1	2	3	4	5	NA												
Employer	1	2	3	4	5	NA	1	2	3	4	5	NA	1	2	3	4	5	NA												
Co-Workers	1	2	3	4	5	NA	1	2	3	4	5	NA	1	2	3	4	5	NA												
Clergyman	1	2	3	4	5	NA	1	2	3	4	5	NA	1	2	3	4	5	NA												
People at my church or Synagogue	1	2	3	4	5	NA	1	2	3	4	5	NA	1	2	3	4	5	NA												
Therapist/Counselor/ Case-Manager	1	2	3	4	5	NA	1	2	3	4	5	NA	1	2	3	4	5	NA												
AA sponsor	1	2	3	4	5	NA	1	2	3	4	5	NA	1	2	3	4	5	NA												

APPENDIX F

GATEWAY REHABILITATION CENTER
ADULT DEMO

1. SEX: _____ (1) Female _____ (2) Male
2. DATE OF BIRTH:
3. CURRENT AGE:
4. ETHNIC BACKGROUND
_____ (1) Caucasian _____ (4) American Indian
_____ (2) Hispanic _____ (5) Asian
_____ (3) African American _____ (6) Other: _____
5. MARITAL STATUS
_____ (1) Never married _____ (4) Separated
_____ (2) Living together/unmarried _____ (5) Divorced
_____ (3) Married _____ (6) Widowed
6. EDUCATION
_____ (1) None _____ (7) GED
_____ (2) 8th Grade _____ (8) Partial College/Technical/Business
_____ (3) 9th Grade _____ (9) College Graduate
_____ (4) 10th Grade _____ (10) Partial Graduate/Professional School
_____ (5) 11th Grade _____ (11) Graduate or Professional Degree
_____ (6) 12th Grade
7. EMPLOYMENT STATUS
_____ (1) Never worked _____ (4) Part time
_____ (2) Currently unemployed _____ (5) Military
_____ (3) Full time _____ (6) Other: _____
8. TREATMENT HISTORY: Please list number of times you've been in treatment and type of treatment (for example: detox, inpatient, outpatient, etc)

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